

*Notes on Materia Medica*

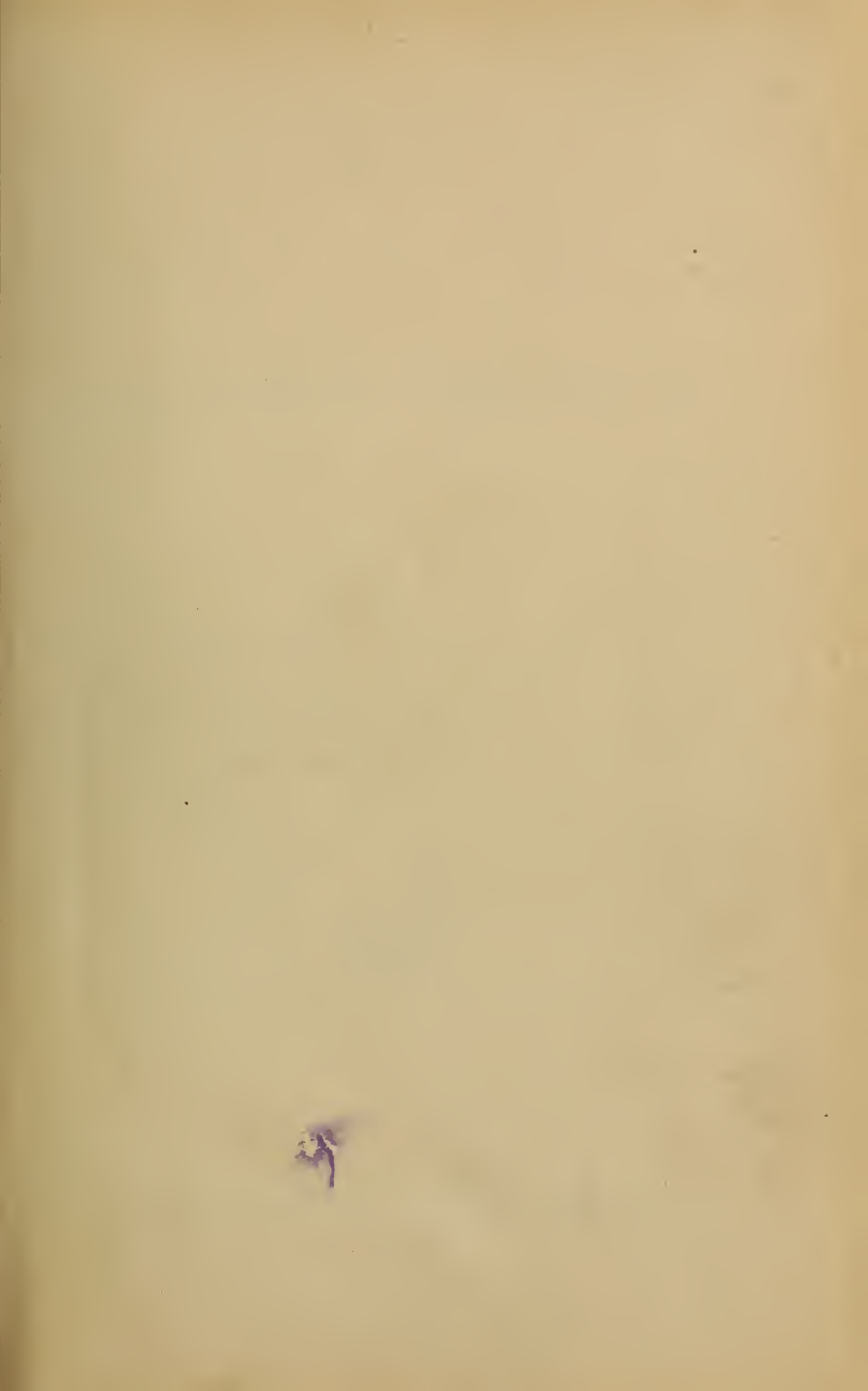


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NOTES

ON

# MATERIA MEDICA.

BY

ROBERT F. WILLIAMS, M. A., M. D.,

PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS IN THE MEDICAL  
COLLEGE OF VIRGINIA.

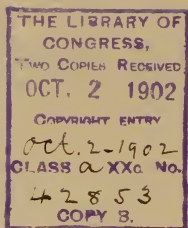
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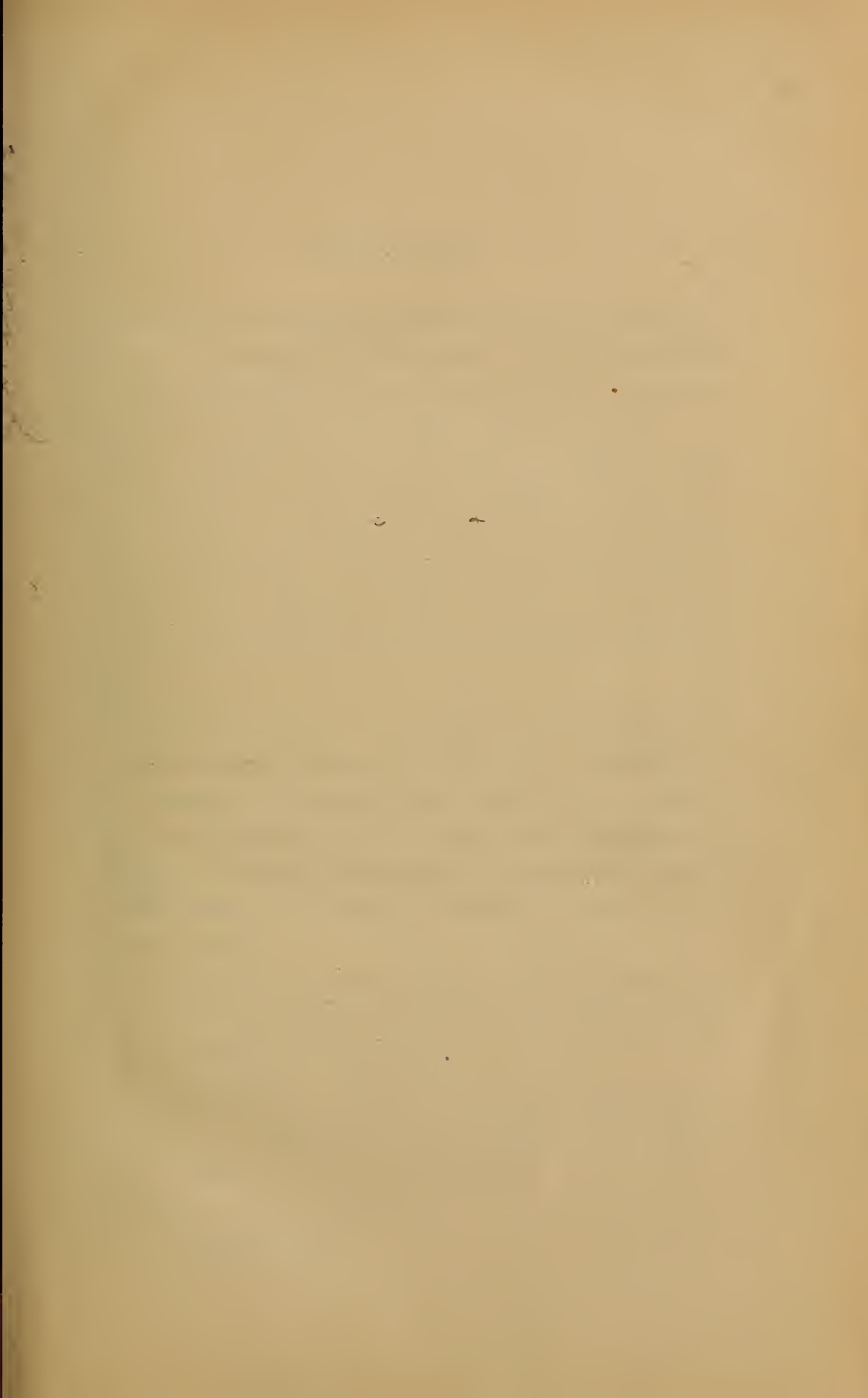
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1902.

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1902





## PREFACE.

THIS book is throughout entirely selective in character, and aims in no degree at completeness. It is not intended to replace the regular text-book, but has been written as an aid to the student in the study of the text-book.

Much confusion arises in the minds of students from the enumeration of many different theories in regard to disputed points, and I have, therefore, in this book made categorical statements concerning such doubtful matters, choosing the explanation which seemed to me most rational, with the view of simplifying for them an intricate subject.

Parenthetical references throughout the description of the different drugs refer, under the titles "Antagonists" and "Synergists," to other drugs having like or contrary action, for comparison with the one under consideration.

Under the heading "Therapeutics" numerical references show the action of the drug for which it is indicated in the given disease.

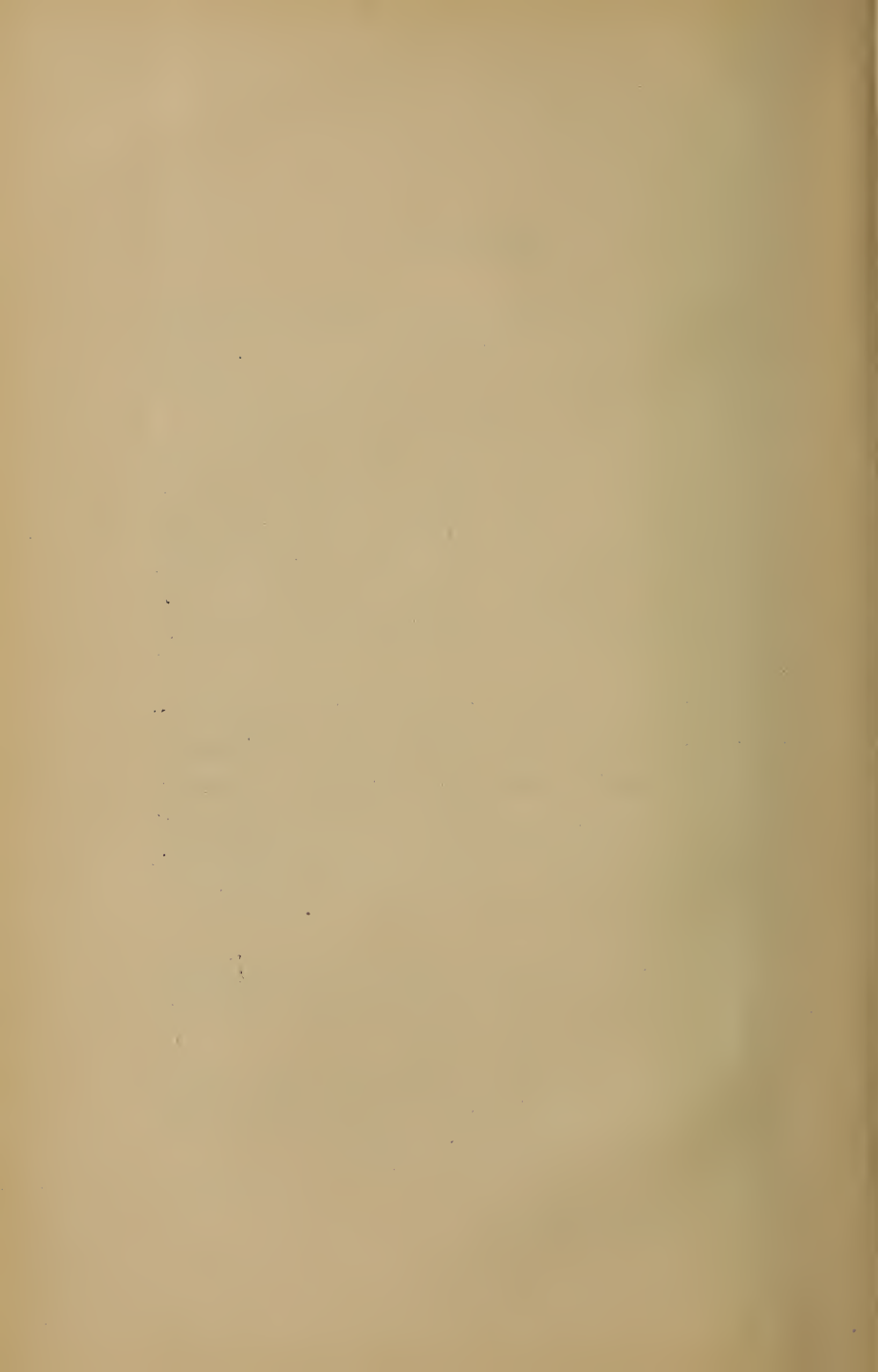
The latter part of the book contains a list of the preparations of the drugs herein described in most common use, at least in this part of the country.

In the preparation of these notes, I have made free use of works on the subject by Butler, Cushny, Wood, Hare, Wilcox, Ringer, Thornton, and others.

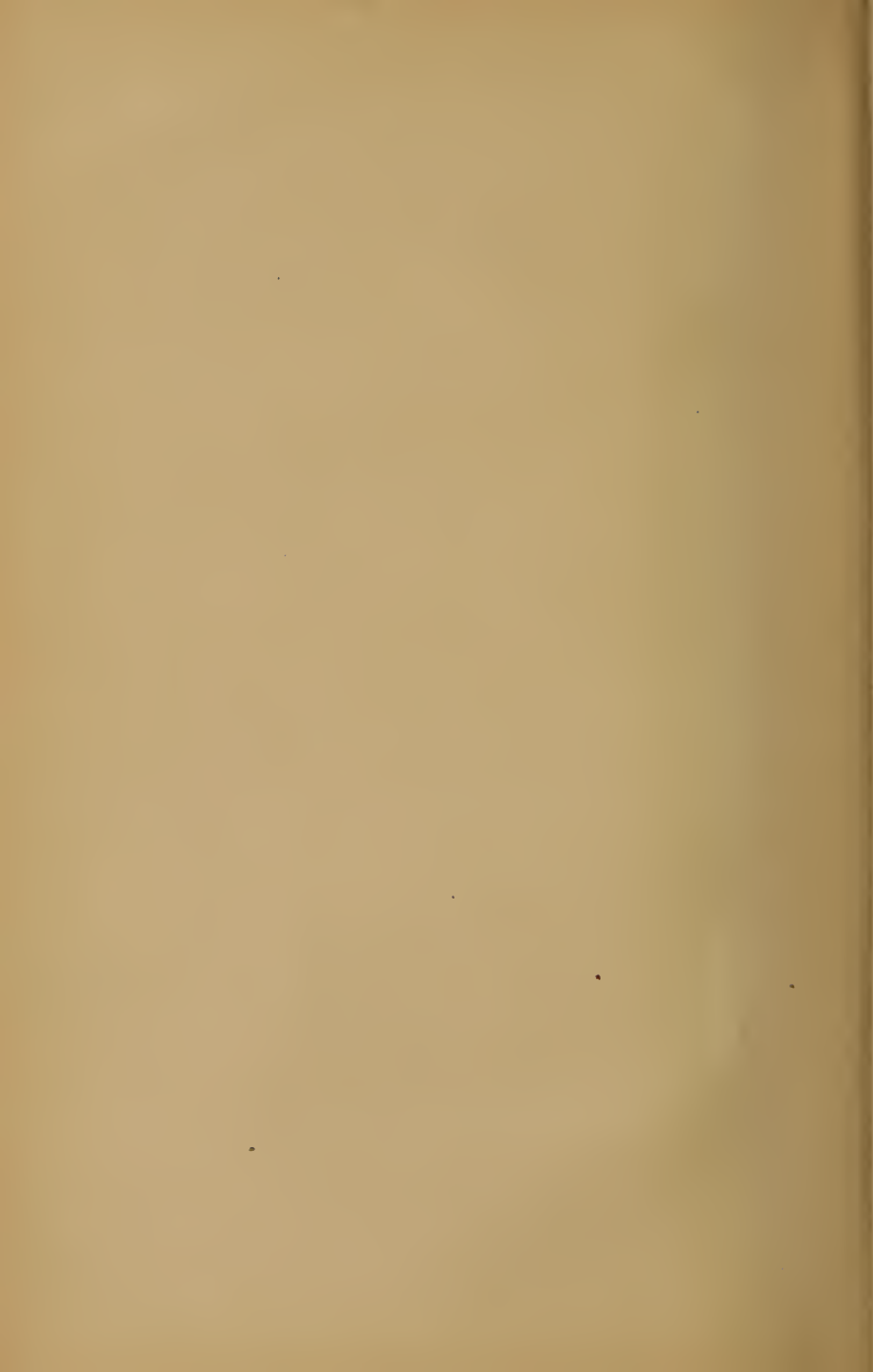
R. F. W.

508 EAST GRACE ST., RICHMOND, VA.,

*September, 1902.*





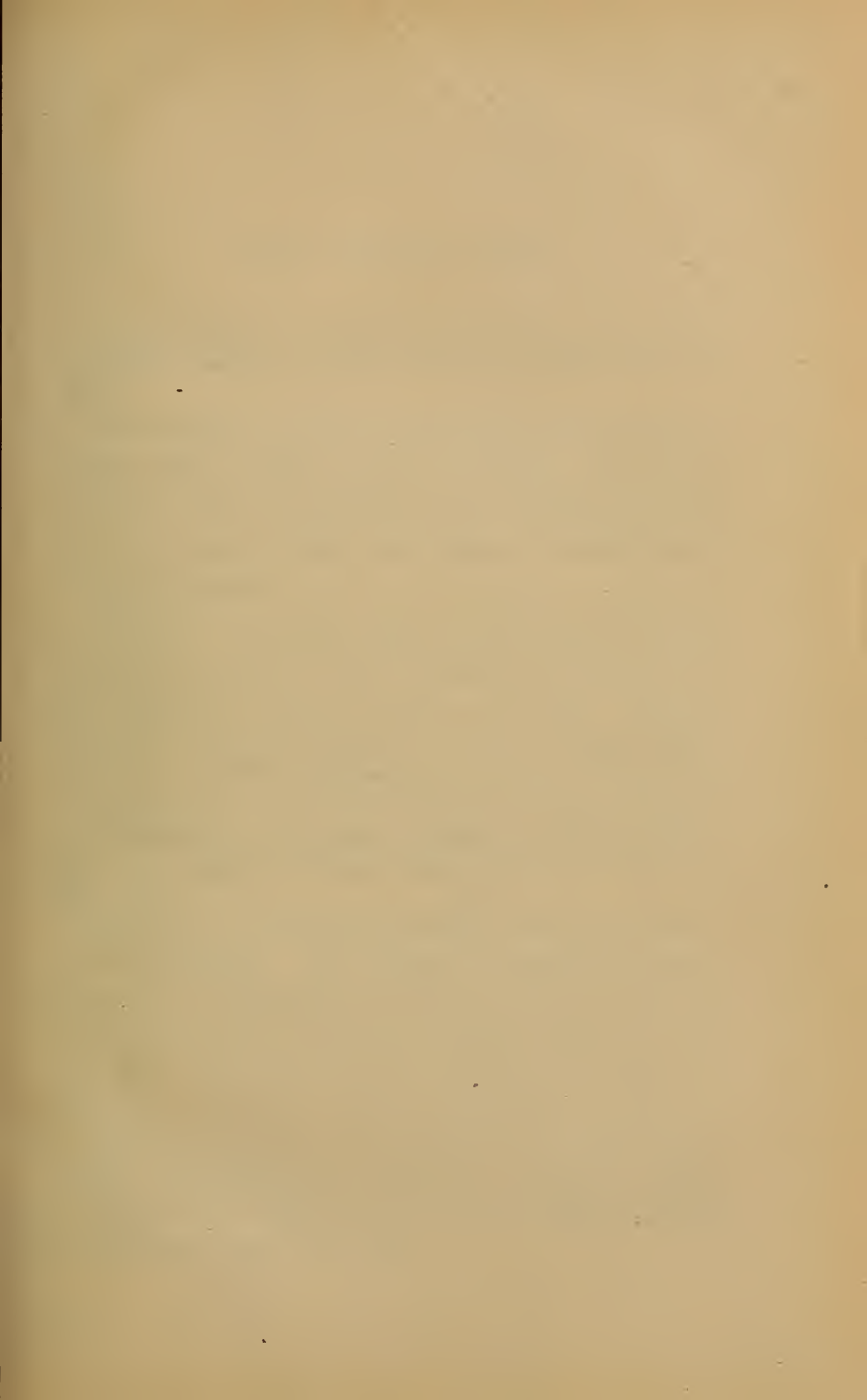




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## HOW DRUGS ACT.

A SMALL number of drugs act *physically*, e. g., oils as protective dressings; salts in changing osmotic values of fluids.

Most drugs act by *chemical affinity* for certain forms of living matter, probably forming temporary combinations with some forms of protoplasm, and altering the function of all cells which contain these forms. This alteration of function is only of degree, the character of the function remaining the same.

Drugs may act in three ways—*stimulation*, *depression* or *irritation*. *Stimulation* is the increase of the specialized functional activity of a cell. *Depression* is the decrease of the specialized functional activity of a cell. *Irritation* produces physical alteration of a cell. The less highly specialized cells are more subject to irritation, which may be explained by their known reactions, e. g., substances which dissolve or precipitate proteids, or withdraw fluids; the more highly specialized cells are more subject to stimulation.

Excessive or prolonged stimulation will cause depression of protoplasm. This depression resembles the fatigue produced by the continued normal function of the cell. This may go on to paralysis, in which condition the cell is functionally dead, but after elimination the function is restored. Excessive irritation causes actual death and disintegration of the cell, from which there is no recovery.

Most drugs have an elective affinity for certain definite tissues. That this is not a difference in degree is shown by the fact that some drugs will act in an opposed manner on different parts of the body.

The *primary action* is that due to the unaltered drug; the *secondary action* is that due to compounds formed with the drug while in the body. The *local action* of a drug is that produced by its direct contact with an organ. This may be *immediate*, i. e., before entering the circulation, or *remote*, i. e., in the act of elimination from the circulation. *Systemic action* is that produced while the drug is being conveyed by the blood to the various tissues and centers. *Reflex action* is that produced at a distant part through the influence of nervous connections.

In certain instances a marked relationship has been observed between the chemical constitution and the physiological action of drugs. In chemical combinations sometimes the base and sometimes the acid seems to determine the action.







# DRUGS ACTING SYSTEMICALLY.

---

## STIMULANTS OF THE NERVOUS SYSTEM.

### VOLATILE OILS.

This group of drugs includes a large number of preparations which depend chiefly, if not entirely, on the volatile oil contained. Though they will be divided later into several smaller groups according to their special action, they all possess certain action in common as follows:

1. **External Action.** Antiseptics, due to their volatility enabling them to penetrate protoplasm readily. They differ in germicidal power, and affect moulds more than bacteria. Confined on the skin, they are irritants, causing redness, tingling, warmth (local hyperemia).

2. **Internal Action.—Digestive Tract.** In the mouth they are antiseptic and irritant to the mucous membrane. They cause reflexly a flow of saliva and gastric juice. Stomach, antiseptic; irritant, causing hyperemia, thereby increasing absorption; they increase the muscular activity of the stomach, and stimulate reflexly the flow of gastric juice. Intestines, as in the stomach, they act as antiseptics, stimulants to peristalsis, and produce hyperemia, increasing absorption. Carminatives.

3. **Systematic Action.** Absorbed into the blood, they stimulate the various nerve centres, and increase mildly circulation and respiration.

4. **Absorption and Elimination.** They are quickly absorbed, and are eliminated by the bronchial mucous membrane, kidneys and skin, stimulating the functional activity of these parts and exerting their antiseptic action. These effects are produced by direct stimulation of the glandular cells, by increasing the blood supply locally, and by stimulation of the nerves supplying the glands.

**Poisoning.** Symptoms of gastric, intestinal and renal irritation; vomiting, purging, acute abdominal pain, blood in stools and vomited matter, collapse, weak pulse and respiration, anuria or albumin and blood in the urine, coma and death.

**Classification.** These drugs are classified as follows:

Class I. Acting on or used chiefly for stimulation of the heart and central nervous system.

Class II. Acting on or used chiefly for stimulation of digestive tract.

Class III. Acting on or used chiefly for stimulation of bronchial mucous membrane.

Class IV. Acting on or used chiefly for stimulation of kidneys and genito-urinary tract.

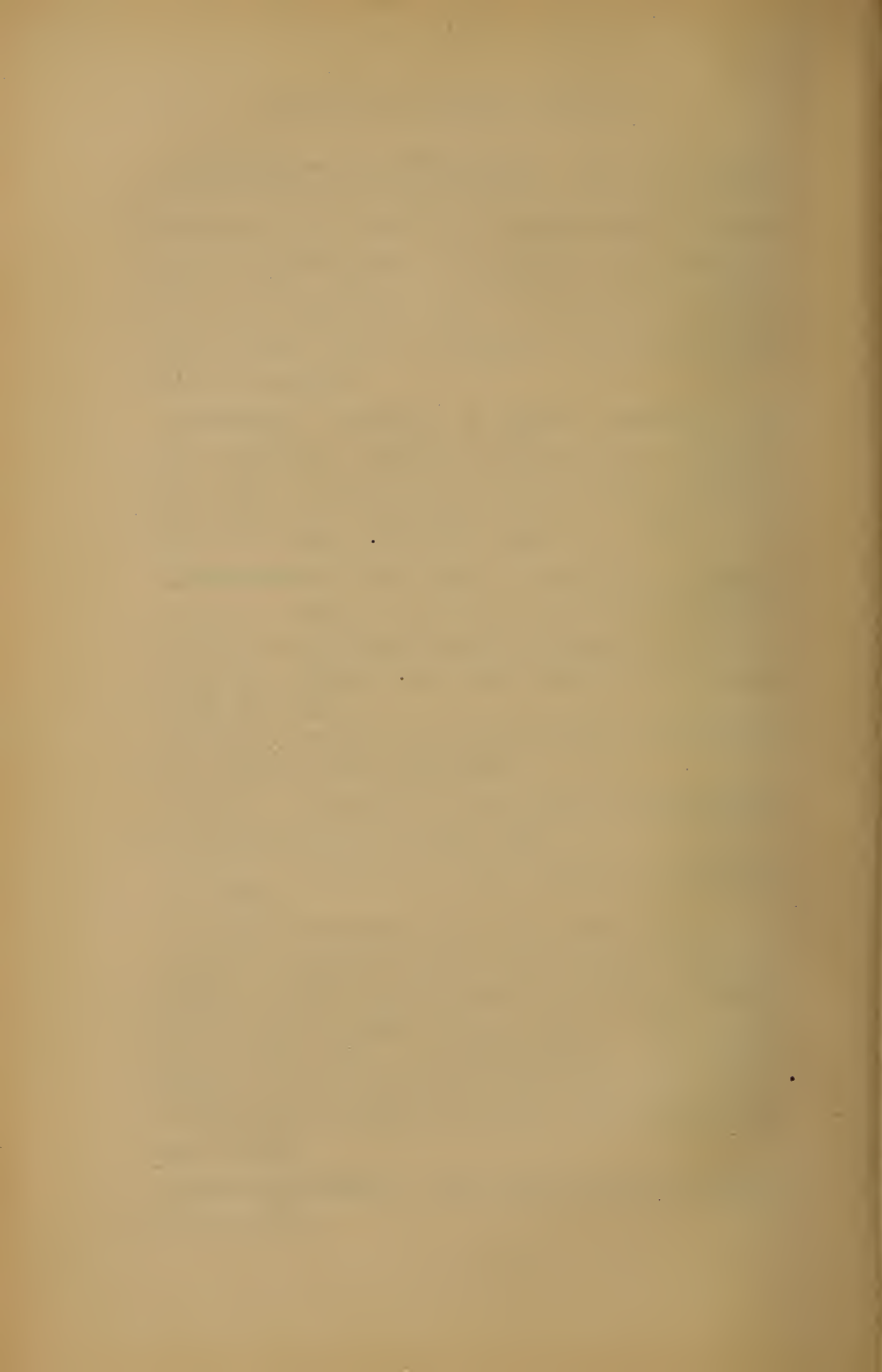
Class V. Acting on or used chiefly for stimulation of the skin.

The last four classes will be considered later.

Class I. contains the following drugs: Asafetida, camphor, musk, ammoniacum and valerian. These constitute the so-called "antispasmodics." The special action of this class is the stimulation of the higher inhibitory centers, increasing the coördinating power, and depression of the lower centers, diminishing muscular activity.

**Contra Indications.** Acute inflammations of gastrointestinal tract.





Comparison of individual characteristics.

**Asafetida** is the most laxative, exerts the greatest influence on menstruation, gives characteristic odor to excretions and in poisoning causes more gastrointestinal disturbance.

**Therapeutics.** Atonic dyspepsia, constipation, flatulent colic (2); infantile convulsions, whooping-cough, chorea, hysteria (3).

**Camphor** is the most irritant to digestive tract, most stimulant to general circulation, large doses (monobromated) depress respiration and generative functions, may cause headache, vertigo, dry mouth, flushing, clamminess, etc.

**Therapeutics.** Erythema, urticaria, "chapped skin," coryza, ozena (1); flatulent colic, diarrhea, cholera (2); whooping-cough, chorea, melancholia, mania, delirium of fevers (3); dysmenorrhea, chordee, phthisical and rheumatic sweats, enuresis (4).

**Musk** is nearly like camphor.

**Therapeutics.** Hysteria, hiccough, crises of low fevers, adynamic pneumonia (3).

**Ammoniacum** has more effect on bronchial mucous membrane.

**Valerian** may cause in large dose formication of the hands and feet, and a condition approaching melancholia. Sometimes it produces hallucinations. Gives characteristic odor to the urine. More effective than asafetida in hysteria. Both owe effects largely to their bad odor.

**Therapeutics.** Like asafetida, menopause (vasomotor disturbances), hypochondriasis, nervous headache, vertigo (anemic), diabetes (3).

**AROMATICS.**

Amisum, cinnamomum, coriandrum, foeniculum (fennel), capsicum (cayenne pepper), piper (black pepper), myristica (nutmeg), macis (mace), caryophyllum (cloves), pimenta (allspice), cajuput, cardamomum, zingiber (ginger), lavandulae flores (lavender), mentha piperita (peppermint), menthol, mentha viridis (spearmint), thymol, carum (caraway).

The action of these drugs depends on the volatile oils which they contain, and is like that of the other volatile oils elsewhere described. [Classes II. and V.]

**Therapeutics.** Flatulence, for flavoring, corrective to purgatives, counter irritation, gastric fermentation, colic, simple diarrhea.

**Contra Indications.** Acute inflammatory conditions of the gastro-intestinal tract.

**CANNABIS INDICA. (Hashish.)**

*Incompatibles*—Caustic alkalies, acids, aqueous preparations.

1. **External Action.** On the skin it is mildly sedative to sensory nerve terminals.

*Antagonists*—Irritants, rubefacients, etc. *Synergists*—Cocaine, belladonna, aconite, etc.

2. **Internal Action.—Digestive Tract.** Slightly sedative to the stomach, it produces no constipation.

*Antagonists*—Bitters, strychnine. *Synergists*—Aconite, cocaine, bromides, etc.

3. **Circulation.** Slight acceleration of the pulse and slight increase of arterial tension due to general nervous stimulation.

*Antagonists*—Aconite, etc. *Synergists*—Alcohol, ether and other cardiac stimulants.

4. **Nervous System.** Like opium, it first stimulates, and then depresses the brain. Stimulation lasts longer,







but sleep is not so profound, and is disturbed by dreams and illusions. Analgesic, but feebler than opium. It causes some tingling and numbness followed by cutaneous anesthesia.

*Antagonists*—Strychnine, etc. *Synergists*—Alcohol, ether, bromides, opium, cocaine, narcotic drugs.

5. **Respiration.** No marked action. General nervous stimulation may quicken slightly.

6. **Eye.** Pupil dilated and vision exaggerated.

7. **Uterus.** Stimulates uterine contractions, but cannot inaugurate them.

8. **Elimination.** Slow, often twenty-four to thirty-six hours, avenue unknown. The urine is increased, but other secretions are not affected.

**Poisoning.** Happy delirium; loss of sense of time; double consciousness as if the hemispheres were acting independently; loss of sense of space; reasoning power retained; sometimes oppression and anxiety; desire to kill; increased sexual desire, but not power. Depression follows; lessened motor power; dullness; lassitude; headache; vertigo; insanity.

**Treatment.** Stomach pump; strychnine; faradism; lemon juice; caustic alkalies incompatible.

**Administration.** Preparations vary greatly in strength, therefore begin always with minimum dose, and increase till effects desired are obtained.

**Therapeutics.** Not much used. May be tried when opium is contraindicated. Melancholia, mania, neuralgia, migraine, irritable cough of phthisis and bronchitis, spasm of bladder, chordee (4); corns (1); subinvolution, chronic metritis, dysmenorrhea, menorrhagia (7).

**COCA—COCAINE.**

*Incompatibles*—Caustic alkalies, alkaline carbonates and bicarbonates, mercury, bichloride, iodides, ammonia, borax.

1. **External Action.** Absorbed by mucous membrane, but not by the unbroken skin. It paralyzes the sensory nerve terminals, producing local anesthesia, and causes vaso-motor constriction followed by dilatation. **Eye.** Anesthetic by action on sensory nerve terminals. Dilates pupils by stimulation of peripheral ends of the sympathetic nerves, the pupil still, however, reacting to strong light. It does not paralyze accommodation.

*Antagonist*—Physostigma. *Synergist*—Atropine.

2. **Internal Action.—Digestive Tract.** By local action in nose and mouth the senses of smell and taste are temporarily destroyed. In the stomach it obtunds the sensory nerves, causing a loss of the sense of hunger, but it does not act as a food. Digestion normal, or better than usual, after its use. Peristalsis stimulated by moderate doses.

*Antagonists* — Irritants. *Synergists* — Aconite, carbolic acid, hydrocyanic acid.

3. **Nervous System.** Stimulant to brain (intellectual centers), producing exhilaration, calm, peace and a sense of wellbeing. This is followed by mental and physical depression. No effect on sensory nerves by internal administration. Excessive dose may cause cerebral convulsions and paralyze sensory nerves. Effects on cord not understood. Stimulation of motor tracts gives sense of muscular power. Muscles are also directly stimulated. Stimulation of constrictor fibers of sympathetic nerve increases activity of non-striated muscular fibers (peristalsis, etc.).

*Antagonists*—Morphine, chloral, chloroform, ether. *Synergists*—Alcohol, belladonna.





4. **Circulation.** The force and frequency of the heart are increased, and arterial tension is raised, but the mode of action is not understood. Excessive doses depress circulation.

*Antagonists*—Amyl nitrite, aconite, etc. *Synergists*—Alcohol, belladonna, strychnine, etc.

5. **Respiration.** Stimulated in frequency and force. Large doses paralyze the respiratory center (dyspnea, etc., death by respiratory failure).

*Antagonists*—Hydrocyanic acid, aconite, bromides, etc. *Synergists*—Belladonna, strychnine, caffeine, etc.

6. **Temperature.** Not affected by medicinal dose, large doses increase by over heat-production.

7. **Absorption and Elimination.** Quickly absorbed. Eliminated changed by kidneys, increasing urinary flow—nitrogenous elements decreased. Partly oxidized in the body. No cumulative action.

**Untoward Action.** Loss of speech, blindness, vertigo, nausea, convulsions, circulatory and respiratory disturbances, copious albuminous urine.

**Cocaine Habit.** Physical symptoms, tendency to collapse, thready pulse, anorexia, emaciation, irregular and depressed respiration, dropsy, numbness, twitchings, convulsions, insomnia, visual hallucinations, headache, vertigo, elevated temperature, fetid breath. Moral and mental degeneration.

**Treatment.** Amyl nitrite, caffeine, ammonia, atropine, chloroform, ether, strychnine hypodermically. Withdrawal of drug (suddenly or gradually). Difficulty of treatment. Prognosis.

**Administration.** Internally at three to six hour intervals. Hypodermically in one to ten per cent. solutions, limit two to three grains. Infiltration method by injection in, not under, the skin of a 0.1 to 0.2 per

cent. solution of cocaine in 0.8 per cent. solution of sodium chloride.

**Therapeutics.** Various minor operations and diseases of eye, mouth, nose, throat, rectum, vagina, urethra (1). Other minor operations hypodermically. Gastralgia, sea-sickness, vomiting (2); convalescence, debilitated conditions (3, 4, 5).

**Contra Indications.** Administer cautiously in disease of the kidneys, and in case of weak or diseased heart.

### CAFFEINE.

1. **External Action.** It has practically no action.

2. **Internal Action.—Digestive Tract.** Moderate doses stimulate peristalsis, slightly laxative. In the form of tea, however, this is counteracted by the astringent action of the tannin contained in large amount. Large doses derange digestion, causing catarrh, indigestion, hepatic congestion, etc.

*Antagonists*—Opium, belladonna, bromides. *Synergists*—Bitters, alcohol, physostigma.

3. **Nervous System.** A rapidly acting stimulant of the brain and cord, causing increased rapidity of thought by stimulation of the intellectual centers, increasing power for continued mental work, differing from opium in that the latter stimulates the imaginative centers. Moderate doses increase reflexes (refreshing), larger doses or continued dosage excite reflexes (nervousness), excessive doses diminish reflexes. Continued use causes wakefulness, delirium, etc.

*Antagonists*—Bromides, chloral, opium, trional, etc. *Synergists*—Strychnine, coca, alcohol, etc.

4. **Circulation.** Stimulation, whether by action on nervous system or on heart muscle is unknown. Pulse rate is increased, the period of diastole shortened







(digitalis), and systole lengthened. Arterial tension is raised independent of direct action on the vaso-motor centers.

*Antagonists*—Aconite, nitrites. *Synergists*—Alcohol, digitalis, ammonia, strychnine, belladonna, ergot, etc.

**5. Respiration.** Stimulated by moderate dose and depressed by excessive dose.

*Antagonists*—Hydrocyanic acid, bromides, etc. *Synergists*—Strychnine, belladonna, ammonia.

**6. Absorption and Elimination.** It is freely absorbed. Eliminated by the kidneys, it directly stimulates the renal cells. Blood pressure is at first lowered and then raised. Solids and liquids are increased. Tissue waste is lessened. It is partly oxidized in the body.

*Synergists*—All diuretics.

**Poisoning.** Not frequent. Semi-consciousness, delirium, slow, irregular pulse, clammy skin, anesthesia, reeling gait, frequent copious urination, tetanic convulsions.

**Treatment.** Emetics, stimulants, external heat, etc.

**Untoward Effects.** Cerebral congestion, delirium like alcoholism, rise of temperature, tremors, palpitation, gastralgia, emaciation.

**Administration.** For hypodermic use the sodio-benzoate of caffeine (forty-five per cent.) is more desirable.

**Therapeutics.** Chronic nephritis (6); valvular heart disease, fatty heart, myocarditis, cardiac depression of fevers (4); cardiac and renal dropsy, pleuritic effusion (4, 6); migraine, headache, nervous diarrhea (3); alcoholism, collapse from ether and chloroform, opium poisoning (3, 4, 5); hiccough (3).

**Contra Indications.** Acute inflammations, particularly of the kidneys.

**NUX VOMICA—STRYCHNINE.**

*Incompatibles*—Tannic acid, bromides, iodides, chlorides.

The action of nux vomica and its alkaloid, strychnine, is identical. The action of brucine is like strychnine, but feeble.

1. **External Action.** Strychnine is antiseptic, but is dangerous to use for this purpose on account of the strength of solution necessary.

2. **Digestive Tract.** Acts as a bitter tonic, stimulating the flow of saliva and gastric juice. Direct stimulant to the muscular coats of the stomach and intestines.

*Antagonists*—Opium, belladonna, etc. *Synergists*—Bitters, physostigma, capsicum, etc.

3. **Nervous System.** Stimulant to the central nervous system, especially to the motor side of the cord. Resistance between the sensory and motor tracts lessened. Stimulant to perceptive centers. Conductivity of motor nerves increased. Reflexes increased by augmented susceptibility to stimuli. Stimulates medullary centers. Convolutions of the brain slightly stimulated.

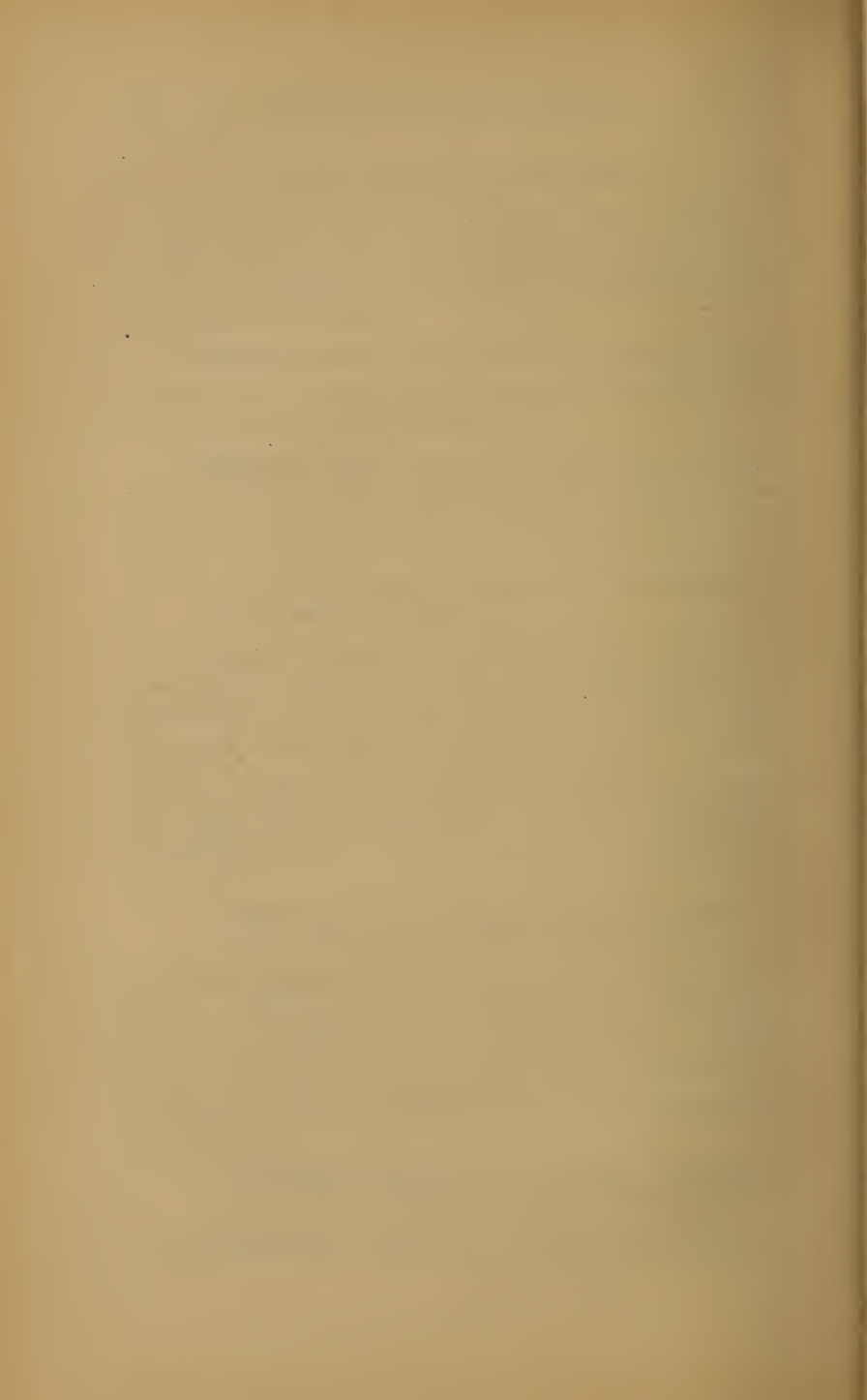
*Antagonists*—Chloral, bromides, chloroform, opium, physostigma, gelsemium. *Synergists*—Caffeine, coca, etc.

4. **Circulation.** Stimulates heart muscle, increasing force. Inhibitory center stimulated, but stimulation of cardiac ganglia prevents slowing of pulse. Arterial tension raised by increased force and by stimulation of vaso-motor center. Poisonous dose reduces circulation by paralysis.

*Antagonists*—Aconite, nitrites, chloroform. *Synergists*—Alcohol, caffeine, digitalis, ammonia, belladonna, ergot.

5. **Respiration.** Respiratory center stimulated, in-





creasing depth and rate. Poisonous dose causes tetanic contraction of respiratory muscles, producing death by asphyxiation, and paralysis of respiratory center. (Heart continues to beat).

*Antagonists*—Hydrocyanic acid, bromides, etc. *Synergists*—Belladonna, caffeine, ammonia, camphor.

6. **Temperature.** Oxidation is increased by strychnine, shown by the increase in urea and carbon dioxide. Heat production is therefore increased, but body temperature is not much increased, due to increased heat elimination by increased superficial circulation. Body temperature much raised during convulsions.

7. **Special Senses.** Vision and hearing more acute. Uterus stimulated.

8. **Absorption and Elimination.** Quickly absorbed and slowly eliminated, strychnine has cumulative action. Eliminated by the kidneys (catheterize in poisoning). Partly oxidized in the body.

**Untoward Action.** Children very susceptible. Long continued may produce peevishness, delirium, etc. Chills in malarial patients (due to stimulation of sympathetic nervous system). Small doses may poison. Scarlatinous rash, red eyes, formication, heavy stiff limbs, persistent and painful erections, etc.

**Poisoning.** Sudden or gradual development. Acuteness of vision and hearing. Stiffness of back of neck. Facial twitchings. Tetanic (or tonic) convulsions. Opisthotonos (emprosthotonos). Eyes staring. "Risus sardonicus." Respiration interfered with. Convulsions, always by peripheral stimulation, may be caused by light, noise, touch, etc. Convulsions not continuous. Painful cramps. Lockjaw late. Death by asphyxiation due to locking of respiratory muscles. Mind unaffected till poisoning by carbon dioxide.

Stomach retentive. Involuntary ejaculation of semen and incontinence of urine. In the intervals the patient is mentally depressed and fearful of death.

**Treatment.** Emetics, tannin and stomach pump. Amyl nitrite, potassium bromide and chloral. By rectum if patient cannot swallow. Chloroform. Catheterization. Move bowels by croton oil per rectum. Physostigma, tobacco, alcohol, opium.

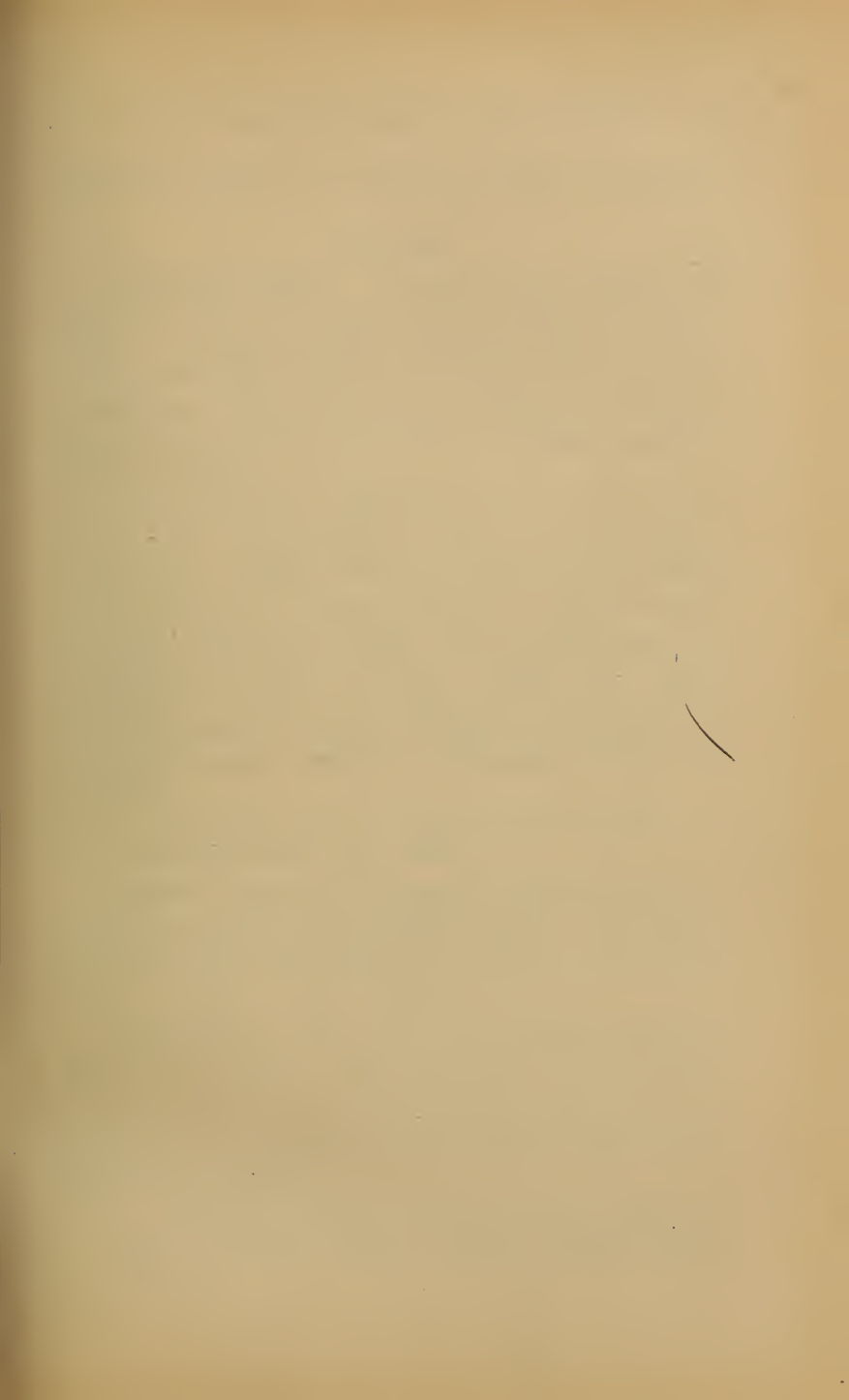
**Differential Diagnosis.** Epilepsy (clonic convulsions). Tetanus (lockjaw early, relaxations never complete, history). Hysteria (hystory).

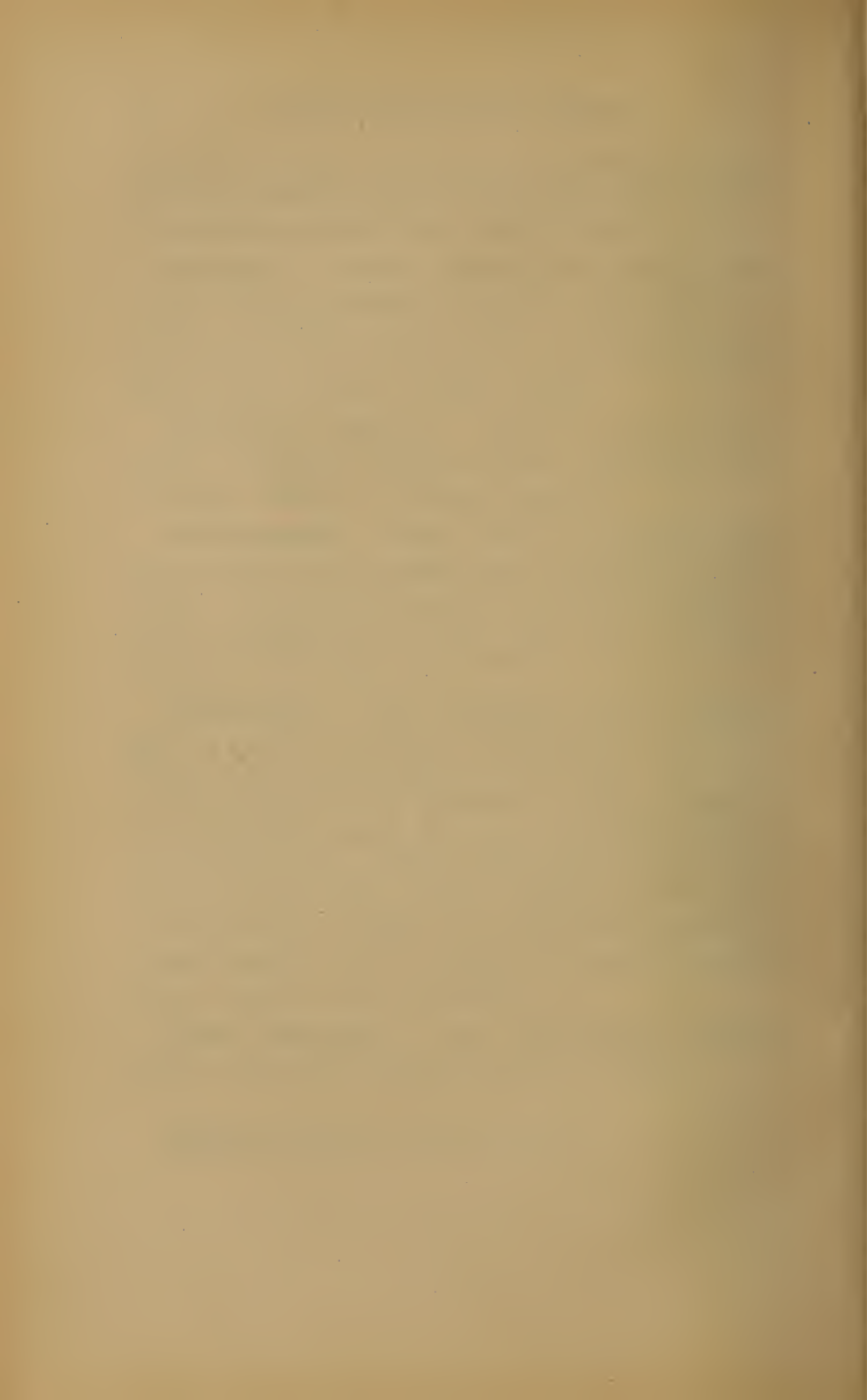
**Administration.** Usually before or between meals. May be given in increasing doses as tolerance is established. Only fresh solutions of strychnine should be used. Preparations of crude drug vary in strength. Strychnine by rectum very active.

**Therapeutics.** Atonic dyspepsia (2, 3); alcoholic gastric catarrh, vomiting of pregnancy, constipation, atonic diarrhoea, prolapse of the rectum (2); pneumonia, typhoid fever, functional cardiac irregularity (4); chlorosis, anemia (2, 3, 4, 5); bronchial and neurotic asthma (3); paralysis, hemiplegia, atonic incontinence of the urine, atonic retention of urine, functional paralysis, myelitis (3); amaurosis, paresis of the ocular muscles (3, 7); alcoholism, narcotic poisoning (3, 4); night sweats of phthisis (3).

**Contra Indications.** Acute inflammatory condition of the spinal cord, excessive reflex irritability.

**Ignatia** is identical with strychnine.







## STIMULANTS OF CIRCULATORY SYSTEM.

---

ALCOHOL.

1. **External Action.** Antiseptic and disinfectant. Hardens tissue. On skin, sense of coldness by evaporation, cutaneous vessels contracted, sweat lessened; rubifacient when confined or rubbed. On mucous membranes, similar, but greater; coagulates albumen and abstracts water, giving white, corrugated appearance, astringent.

2. **Internal Action.—Digestive Tract.** Mouth, sense of warmth, increased flow of saliva by reflex action. Antiseptic. Stomach, sense of warmth, blood vessels dilated, therefore increased secretion of gastric juice, therefore moderate amounts before meals good for digestion in certain conditions. Taken with meals digestion is retarded by coagulation of albumen and the precipitation of pepsin. Large amounts check flow of gastric juice. Intestines, astringent (brandy in diarrhea).

*Antagonists*—Cocaine, hydrocyanic acid, aconite, etc.

*Synergists*—Bitters, nux vomica, etc.

3. **Blood.** Amoeboid movements of white blood corpuscles at first increased and then lessened. Red blood corpuscles hold oxyhemoglobin, therefore combustion is less. Obesity. (See "Temperature").

4. **Circulation.** Rate and force increased reflexly and by stimulation of heart muscle, also by stimulation of accelerator nerves. Arterial tension raised by action on heart, though arteries are dilated by depression of local vasomotor ganglia in vessel walls. Toxic doses depress and paralyze.

*Antagonists*—Aconite, veratrum, antimony, chloral, nitrites. *Synergists*—Digitalis, ammonia, belladonna, ergot, ether, etc.

5. **Nervous System.** Stimulant to brain (directly and by increased blood supply) in moderate doses, rapidity of thought and imagination stimulated; spinal cord, muscles, nerves and reflexes stimulated (symptoms). Larger doses followed by depression in descending order; cerebrum (incoherence of thought and speech), cerebellum and cord (incoördinate gait, etc.), loss of sensation, loss of muscular power, loss of reflexes (injuries do not hurt a drunken man proportionately), involuntary micturation and defecation, finally depression of respiratory and circulatory centres.

*Antagonists*—Bromides, chloral, paraldehyde, opium, physostigma. *Synergists*—Caffeine, strychnine, coca, antispasmodics.

6. **Respiration.** Deepened and accelerated by moderate doses, depressed by toxic doses. Death usually by paralysis of respiratory centre.

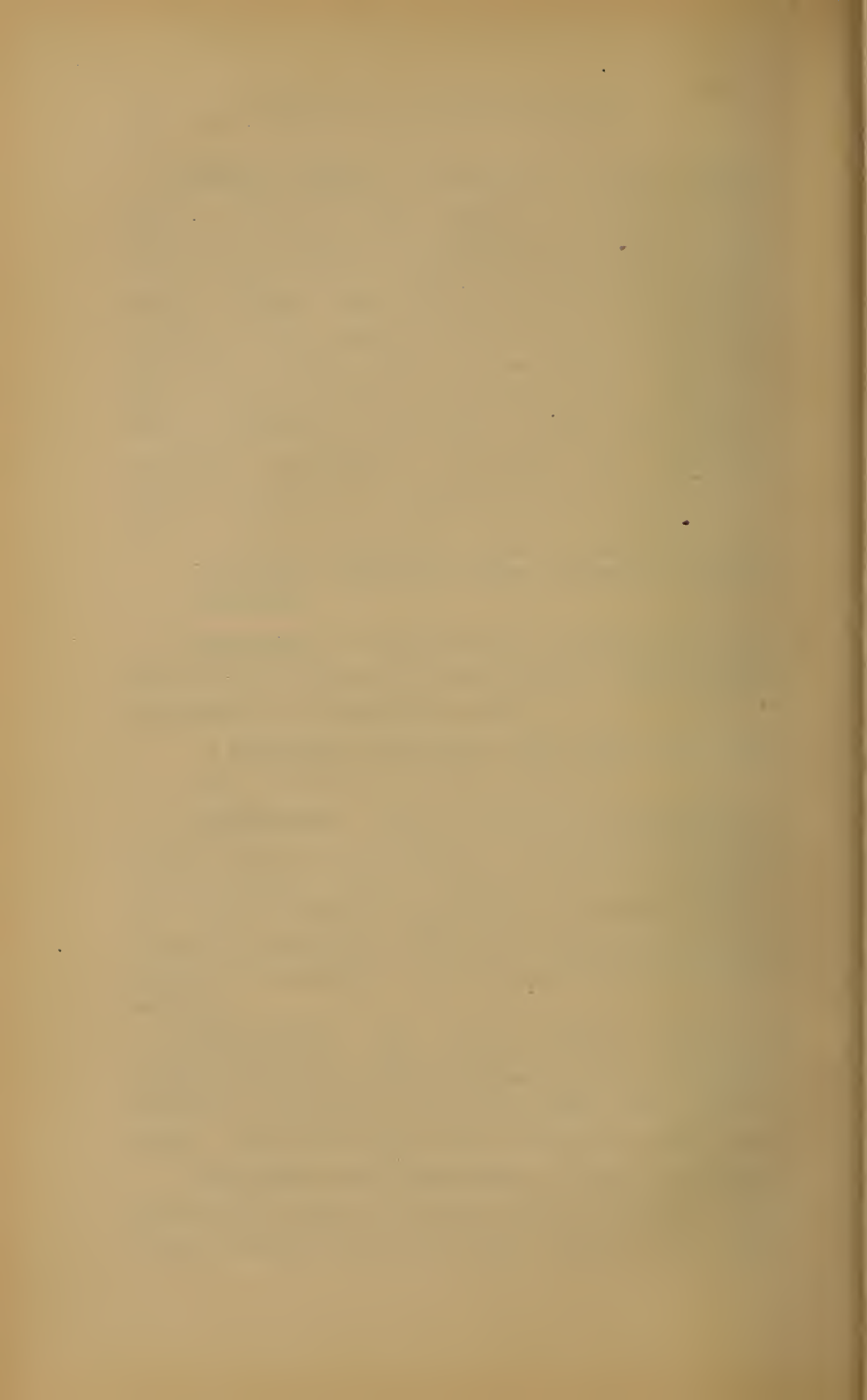
*Antagonists*—Hydrocyanic acid, aconite, etc. *Synergists*—Belladonna, strychnine, caffeine, etc.

7. **Temperature.** Sense of warmth produced by increased cutaneous circulation. Temperature decreased by (a) lessened tissue oxidation, (b) increased radiation due to increased superficial circulation, (c) increased evaporation. Still heat is generated by the oxidation of alcohol. Use and abuse of alcohol in cold weather.

8. **Metabolism.** The carbon dioxide given off usually increased, while nitrogenous waste is lessened. Alcohol is oxidized in the body adding force, but not tissue. Increase of tissue due to saving of other foods.

9. **Absorption and Elimination.** Quickly absorbed. Eliminated in part by lungs, skin, kidneys and liver. Urine increased by raised blood pressure, but solids





diminished. Sweat increased by stimulation of the glands and by increased cutaneous circulation.

*Antagonists*—Belladonna, salicylic acid, etc. *Synergists*—Diuretics and diaphoretics.

**Poisoning.—Acute.** Drunkenness. Delirium tremens, anorexia, insomnia, restlessness, tremor of tongue and muscles; vision and hearing; mental depression; cold extremities; weak pulse; talkative delirium; fear; mania.

**Treatment.** Heat, strychnine, digitalis, belladonna, etc., capsicum, aconite, cocaine, ipecac for vomiting. Purges. Chloral, bromides, etc. Fowler's solution for morning vomiting. Ammonium chloride in thirty grain doses.

**Chronic.** Gastritis, cirrhosis of organs, acne rosacea, neuritis, paralysis, ataxia, nephritis, mental disturbances.

**Treatment.** Abrupt withdrawal or tapering off. Isolation. Stimulant food. Danger of pneumonia.

**Administration.** It should be given with food preferably. Brandy is the best astringent. Brandy and champagne are the best for nausea. Whiskey is the least constipating, but gin is the most diuretic. Claret, beer and whiskey are used as stomachics. As cardiac stimulants use brandy or whiskey hypodermically hot or cold.

**Therapeutics.** Contusions, sprains, indolent ulcers, bed sores, capillary oozing, urticaria, frost bite, pharyngitis, sore nipples, to reduce fevers, hyperhidrosis, swollen painful joints (1); atonic dyspepsia, convalescence, vomiting, gastralgia, flatulence, diarrhea (2); syncope, asphyxia, collapse, narcotic poisons, snake bite, adynamic heart in febrile diseases (4, 5, 8); pyemia, septicemia, erysipelas, diphtheria, phthisis (3, 4, 5, 8); anemia, chlorosis (2, 4, 8); cold (9).

**Contra Indications.** Urine of high specific gravity, inflammatory diseases of the genito-urinary tract, diseases of the liver, gout, eczema, cardiac hypertrophy with excessive action.

#### AMMONIA AND AMMONIUM COMPOUNDS.

*Incompatibles*—Acids and acidulous salts, earthy salts, lime water.

1. **External Action.** Applied to the skin the drug is a rubifacient and vesicant, but does not destroy the epidermis as do the other alkalies. Inhaled it produces by reflexes through the fifth nerve lacrymation, spasm and edema of the glottis.

*Antagonists*—Emollients, fumes of Hcl. *Synergists*—Irritants.

2. **Internal Action.—Digestive Tract.** In medicinal doses the drug stimulates the mucous membrane of the stomach, increasing secretions if given before meals. It counteracts acidity if given after meals. In concentrated or excessive doses it produces inflammation of the mucous membranes, gastro-enteritis with coma.

*Antagonists*—Oil, etc., in poisoning. *Synergists*—Other alkalies.

3. **Nervous System.** Moderate doses stimulate the motor tracts of the cord; applied directly to the nerve tissue, it paralyzes it. Injections may cause convulsions of spinal origin.

*Antagonists*—Chloral, physostigma, etc. *Synergists*—Strychnine.

4. **Circulation.** A rapid fleeting stimulant to the pulse rate and force and to the arterial tension (by action on accelerator nerves and heart muscle, and possibly the vaso-motor center also). In large







amounts, as in intravenous injection, it paralyzes the muscular walls of the heart. The drug is normally present in the blood. In large amounts it lessens the oxygen-carrying power of the red blood corpuscles and its coagulability.

*Antagonists*—Aconite, chloroform, veratrum, etc. *Synergists*—Alcohol, ether, strychnine, etc.

**5. Respiration.** By reflex action and by direct stimulation of the respiratory center, respirations are stimulated and become more full and more rapid.

*Antagonists*—Hydrocyanic acid, chloral, opium, etc. *Synergists*—Strychnine, belladonna, caffeine, ether.

**6. Absorption and Elimination.** The drug is quickly absorbed and is partially destroyed in the body, and is partially eliminated by the kidneys, increasing uric and nitric acids, and, if given in large amounts, partially by the lungs.

**Poisoning.** Ammonia is a powerful corrosive poison, causing gastro-enteritis, labored breathing, circulatory depression and muscular weakness.

**Treatment.** Vegetable acids, demulcent drinks, opium for pain.

**Administration.** Liquid preparations must be well diluted. As the drug is fleeting in its action, it must therefore be repeated at short intervals to maintain its effect.

**Therapeutics.** Alopecia, chilblains, certain skin diseases, chronic rheumatism, inflammation of joints, insect bites (1); fainting (4, 5); acid stomach (2); nervous headache, alcoholism, cardiac failure, snake bite (4); pneumonia, continued fevers (4, 5); chronic bronchitis, broncho-pneumonia (5, 6); thrombosis (4).

**Contra Indications.** Acute gastritis, excessive

acidity of the urine, anemia and emaciation from prolonged use.

### AMMONIUM SALTS.

**Ammonium Acetate** (Spirit of Mindererus). In the stomach like other alkalies. Diuretic or diaphoretic.

**Ammonium Benzoate.** Diuretic, due to benzoic acid.

**Ammonium Bromide.** See "Bromides."

**Ammonium Carbonate.** Probably decomposed in the stomach with the liberation of ammonia. Like ammonia in its action. Expectorant.

**Ammonium Chloride.** No effect on heart or respiration, stimulant to mucous membranes, increasing secretion. Expectorant, cholagogue, purgative, in large dose, increases the excretion of urea.

**Ammonium Valerinate.** See "Valerian."

### DIGITALIS.

*Incompatibles*—Ferric chloride and sulphate, cinchona, tannic acid, lead acetate and subacetate.

1. **External Action.** Slightly irritant to skin and readily absorbed by the skin; slightly sedative to nerve terminals.

**Internal Action.—Digestive Tract.** Irritant to mucous membrane (stomach and bowels), therefore avoid in gastritis, etc.

2. **Nervous System.** Medicinal doses produce no effect on the general nervous system. Small toxic doses decrease reflex excitability by stimulation of inhibitory centers in the medulla, finally depressing the cord. Convulsions by effect of decomposition products of digitalis. Finally motor nerve trunks depressed and muscles paralyzed.





3. **Circulation.** Heart muscle is stimulated, therefore increased systole and greater pulse force. Inhibitory nerve is stimulated, causing prolonged diastole, and therefore greater pulse volume. Note the antagonism between these two actions. Arterial tension is increased by the greater volume of blood and by the stimulation of the vaso-motor center and the local ganglia in the vessel walls. Digitalis acts as heart tonic in two ways, by stimulation of the vagus nerve, which is the trophic nerve of the heart, and by its effects on circulation. Increased volume and prolonged diastole furnish more blood for a longer time to the heart muscle. Note that high fever prevents slowing by depression of the vagus nerve.

Poisonous doses cause irregular, hobbling pulse, due to an inequality between the inhibitory and muscular stimulation, and a loss of coördination between auricles and ventricles (expt. heart ligated between auricles and ventricles; clinical proof, stimulation of cut ends of vagus causes this pulse). Pulse may be rapid and shuttle-like, with low arterial tension due to depression of vaso-motor center and ganglia in the muscular walls of the blood vessels. Rapid pulse due to depression of the peripheral ends of the vagus nerves. Death by arrest in diastole.

*Antagonists*—Aconite, veratrum, chloral, nitrites, emetics.

*Synergists*—Alcohol, ammonia, etc., ergot, belladonna.

4. **Respiration.** Medicinal doses no effect, poisonous doses cause slowing.

5. **Temperature.** No effect in health. Antipyretic in fevers, but too slow to use for this purpose.

6. **Kidneys.** Diuretic through effects on circulation. Digitoxin and digitalein dilate renal arteries, digitalin contracts general vessels, thereby raising pressure in

the glomeruli greatly. Watery part increased, solids unaffected. Spasm of vessels may occur with suppression.

*Antagonists*—Nitrites, aconite, etc. *Synergists*—Diuretics.

**7. Absorption and Elimination.** Rapidly absorbed, slowly eliminated, cumulative action, therefore danger in ascites, crisis in fever, etc. Probably oxidized in the body.

**Poisoning.** Gastro-enteritis, rapid, irregular, compressible pulse; syncope when patient is raised; headache, double vision; exophthalmus; blue pearliness of eye. Death by heart failure, may be in two or three hours or in several days.

**Treatment.** Horizontal position; tannic acid; emetics (?) or stomach pump; aconite; external heat.

**Administration.** Digitalin, digitalein and digitoxin stimulate heart muscle; digitalin the vaso-motor center; digitonin depresses. Digitonin soluble in water, sparingly in alcohol. Digitalein is soluble in water and in alcohol. Digitalin insoluble in water, but freely in alcohol. Digitoxin slightly in both. Therefore the infusion contains much digitonin and little digitalin, and is not a powerful heart stimulant, while the tincture and fluid extract contain little digitonin and much digitalin, being therefore powerful heart stimulants. Infusion to be used as diuretic, as spasm is avoided by the small amount of digitalin present, but if renal stasis is present and the heart weak, the tincture or fluid extract is better. The infusion is more irritating to the stomach on account of the digitonin present.

Preparations are variable and unreliable. May be used hypodermically as tincture or fluid extract. Digitalis leaves as poultice. Note that in children digitalis often causes an irregular pulse.







**Therapeutics.** Acute inflammation of the joints, congested kidneys (1); valvular heart diseases, when compensation fails, cardiac dilatation, irritable heart, collapse from shock, poison or disease, low arterial tension, e. g., after hemorrhage, second stage of pneumonia, congestion of the lungs complicating exhausting diseases (3); scarlet fever (3, 6); delirium tremens, acute mania, epilepsy (2, 3); hemoptysis, epistaxis, menorrhagia, post-partum hemorrhage, purpura hemorrhagica, serous diarrhea, pleuritic effusion (3); cardiac or renal dropsy, chronic nephritis (6, 7).

**Contra Indications.** Degeneration of the heart muscle or of the artery walls, hypertrophy, apoplexy, aneurism, aortic insufficiency (?).

#### STROPHANTHUS.

Compared with digitalis.

**Digestive Tract.** Less irritating.

**Circulation.** Does not stimulate vaso-motor center, therefore arterial tension is not increased except by increased heart action.

**Kidneys.** It has no effect in dilating renal arteries.

**Elimination.** It is more readily eliminated, and therefore has no cumulative action.

**Poisoning.** Poisonous doses paralyze the heart in systole. Strophanthus seems to act better in children than digitalis.

**Administration.** The tincture is the best preparation to use.

**Therapeutics.** In cardiac diseases it is like digitalis, especially in irritable heart, nephritis and in children.

#### CONVALLARIA.

Compared with digitalis; identical excepting the following: Less powerful; has no cumulative action; has stronger diuretic properties.

Convallarin is a drastic purge, and may cause nausea and gastric pain.

**Administration.** The fluid extract is usually given.

**Therapeutics.** Like digitalis.

#### SCOPARIUS. (Sparteïn.)

Certain points disputed.

**Digestive Tract.** Sparteïn sulphate acts like bitters on the stomach. Excessive doses may cause vomiting and purging.

**Circulation.** Laboratory experiments have failed to show action on the circulation. Clinical observations show at first acceleration of the pulse followed by effects like digitalis, except that the arteries are not contracted, and it is not so powerful, but more rapid in action.

**Nervous System.** Depresses brain and spinal cord. Reflex activity lowered through paralysis of the motor tracts of the cord and motor nerve endings. Large doses cause muscular weakness and paralysis.

**Respiration.** No effect from medicinal doses. Toxic doses may cause death by paralysis.

**Kidneys.** Diuretic by action on circulation. (Sparteïn not diuretic).

**Absorption and Elimination.** Rapidly absorbed and eliminated. No cumulative action.

**Administration.** Use the decoction of the drug in dropsy. Sparteïn sulphate in heart diseases given either internally or hypodermically.

**Therapeutics.** It is like digitalis, especially in mitral diseases and in nephritis.

#### SCILLA.

Compared with digitalis.

**Digestive Tract.** More powerful irritant to gastro-





intestinal tract. Vomiting and purging from moderate doses.

**Kidneys.** Excreted by the kidneys, it irritates them, and is therefore a more powerful diuretic.

**Expectorant.** It is excreted by the bronchial mucous membrane, increasing vascularity and secretion, and is therefore a stimulant expectorant.

*Antagonists*—Belladonna, opium, etc. *Synergists*—Expectorants.

In other respects it is like digitalis.

**Administration.** Any preparation, given in increasing doses for diuretic.

**Therapeutics.** It is like digitalis in dropsy, chronic pleurisy, pericarditis with effusion, sub-acute and chronic bronchitis.

**Contra Indications.** Acute bronchitis and phthisis, acute nephritis.

#### CIMICIFUGA.

**Internal Action.** Like bitters.

**Circulation.** It is like digitalis, but is milder.

**Therapeutics.** Chorea, dyspepsia, bronchitis, amenorrhea, dysmenorrhea, neuralgia.

#### ERGOT.

*Incompatibles*—Caustic alkalies, metallic salts.

1. **External Action.** Applied to mucous membranes it is astringent and hemostatic.

2. **Internal Action.—Digestive Tract.** The drug stimulates all involuntary muscle fiber, including the stomach and the intestines, thereby increasing peristalsis. Large doses may irritate the gastro-intestinal tract, causing pain, vomiting, constipation and diarrhea.

*Antagonists*—Belladonna, hyoscyamus. *Synergists*—Phyostigma, strychnine.

3. **Circulation.** Moderate doses stimulate the vaso-motor center, and also the coats of the arteries, causing rise of arterial tension. The heart rate is slowed. Excessive doses may produce a fall in arterial tension by depression.

*Antagonists*—Nitrites, chloral, aconite. *Synergists*—Belladonna, cardiac stimulants.

4. **Nervous System and Respiration.** Both are depressed by large doses.

5. **Secretions.** Are all diminished by the effect on the blood vessels (except the urine).

*Antagonist*—Mercury. *Synergists*—Belladonna, opium.

6. **Uterus.** The drug stimulates the uterine muscle and the uterine center in the lumbar cord, producing in moderate doses tonic unrelaxing uterine contractions. In minute doses it may simply increase the force of the contractions of labor.

*Antagonists*—Opium, chloral, viburnum. *Synergists*—Quinine, strychnine, etc.

7. **Absorption and Elimination.** It is rapidly absorbed, and is eliminated by the kidneys, stimulating them.

**Untoward Action.** Gastro-intestinal disturbances, headache, chilliness, mental depression, dizziness, muscular weakness, dilated pupils.

**Poisoning.—Acute Ergotism.** Symptoms. Restlessness, anxiety, headache, vertigo, slow, weak pulse, shallow respiration, cold skin, cutaneous anesthesia, dilated pupils, nausea and vomiting early or late.

**Treatment.** Symptomatic.

**Poisoning.—Chronic Ergotism.** Convulsive form. Symptoms. Tetanoid spasm of the flexor muscles, uterus, intestinal muscles and muscles of respiration; cataract. Gangrenous form. Symptoms. Coldness







and numbness, formication, loss of sensibility, bullae, gangrene, spinal cord changes from anemia.

**Administration.** Give the fluid extract by mouth for uterine effects. Ergotin or non-alcoholic preparations are preferable for hypodermic use.

**Therapeutics.** Nasal hypertrophies, prolapse of the rectum, hemorrhoids (1), obstetrics, post-partum uterine hemorrhage, subinvolution, submucous uterine fibroids, polypi, congestive dysmenorrhea, menorrhagia, chronic mitritis (6); chronic diarrhea and dysentery (2, 3); incontinence of urine due to paresis of the bladder (2); cerebral hyperemia, cerebro-spinal meningitis, congestion of the spine, congestive headache, erythema, urticaria, various forms of hemorrhage, purpura, acne.

**Contra Indications.** The first stage of labor; cerebral and spinal anemia.

## STIMULANTS OF RESPIRATORY SYSTEM.

### BELLADONNA.—Atropine.

*Incompatibles*—Tannic acid, caustic alkalies.

**1. External Action.—Skin.** The drug is absorbed from the unbroken skin producing constitutional symptoms. Locally causes paralysis of the secretory and sensory nerve terminals, and contracts blood vessels; it is therefore a local anodyne, and checks secretions.

*Antagonists*—Irritants. *Synergists*—Aconite, hydrocyanic acid, etc.

**Eye.** Stimulates the end organs of the sympathetic nerves (radiating fibers), and paralyzes the motor oculi (circular fibers), producing dilatation of the pupil and paralysis of accommodation. Intra-ocular pressure is increased (canal of Schlemm).

*Antagonist*—Physostigma. *Synergists*—Cocaine, stramonium, hyoscyamus.

2. **Internal Action.**—**Digestive Tract.** Lessens secretions of saliva, gastric and intestinal juices by paralyzing the secretory nerve terminals. Minute doses increase peristalsis (paralysis of inhibitory nerve terminals), moderate doses lessen peristalsis (paralysis motor nerve terminals and ganglia in gut wall); large doses stop peristalsis (paralysis of muscles).

*Antagonists*—Cathartics, strychnine. *Synergists*—Opium, astringents, etc.

3. **Circulation.** Heart muscle and accelerator nerves are stimulated, inhibitory nerves are at first stimulated, later they are paralyzed in their peripheral ends, therefore the pulse is at first slow and then rapid. The vasomotor center is powerfully stimulated, increasing arterial tension; large doses paralyze the vasomotor center, causing relaxation of the blood vessels. Death by vasomotor paralysis.

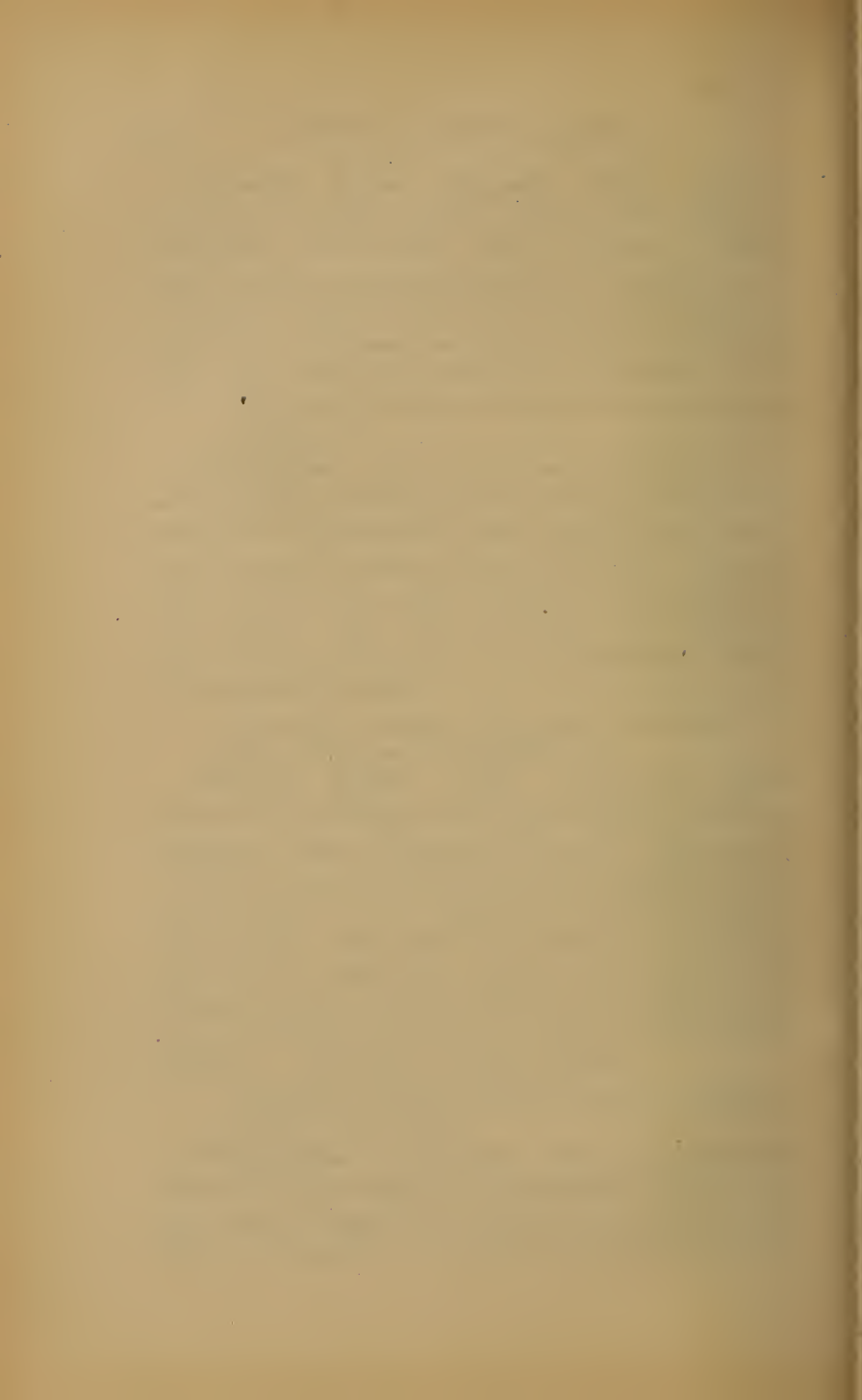
*Antagonists*—Aconite, nitrites, opium, chloroform. *Synergists*—Strychnine, ergot, digitalis, etc.

4. **Nervous System.** Brain. Congested; higher centers first stimulated and then depressed, therefore headache, vertigo, delirium, followed by sleep, stupor or rarely by coma (not like the coma of opium). Cord. Motor centers at first stimulated (increased reflexes, convulsions), then depressed (paralysis of third to tenth dorsal especially). Nerves. Peripheral ends of sensory nerves are depressed by local action (sensation is somewhat impaired, but drug is not a general anodyne). Involuntary muscles relaxed.

*Antagonists*—Chloral, bromides, opium, etc. *Synergists*—Strychnine, coca, caffeine.

5. **Respiration.** Respiratory center is powerfully stimulated, quickening and deepening the action (peripheral ends of vagi nerves are depressed, therefore the effects are irregular). Bronchial secretions diminished





by paralysis of secretory nerve terminals. Death by respiratory failure.

*Antagonists*—Hydrocyanic acid, chloral, aconite, opium.

*Synergists*—Strychnine, ammonia, caffeine.

6. **Temperature.** Increased by large doses through influence on respiration and circulation; falls rapidly in poisoning.

7. **Skin.** Secretion is checked by paralysis of secretory nerve terminals, scarlet eruption, desquamation.

*Antagonists*—Pilocarpine, opium. *Synergists*—Salicylic acid, etc.

8. **Kidneys.** Urine increased by increased arterial tension (not universally observed). All other secretions diminished.

*Antagonist*—Opium. *Synergists*.—Diuretics.

9. **Absorption and Elimination.** The drug is quickly absorbed and rapidly eliminated, chiefly by the kidneys, but also by the bowels. It lessens the irritability and muscular power of the bladder (retention).

**Untoward Action.** Dry red throat and skin, dilated pupils, disturbed vision, erythematous eruption, hallucinations.

**Poisoning.** Symptoms. Great dryness and thirst, dilatation of the pupils, blindness, whole surface of the body red and dry; pulse increasing in rapidity and feebleness, respiration at first stimulated, but fails from over-stimulation, urine expelled with erections, later retention, desire for exercise, but muscular weakness, delirium at first gay, later falling into stupor; convulsions; paralysis.

**Treatment.** Tannic acid, stomach pump, strychnine, digitalis, whiskey, opium, physostigma, pilocarpine, external heat.

**Administration.** Though a narcotic drug, belladonna is well borne by children. Administer every

three to six hours, but watch for untoward symptoms. Give apart from meals.

**Therapeutics.** Boils, carbuncles, chronic inflammation of the joints, orchitis, hemorrhoids, anal fissure, eczema, hyperidrosis, acute and chronic muscular rheumatism, neuralgia (1); gastralgia, constipation (2); lumbago, neuralgia, pleurodynia (4); lactation, salivation, sweating, serous diarrhea (3, 8); incontinence of urine (9); colic, cystitis, prostatitis, spermatorrhea, goiter, cerebral and spinal hyperemia, menorrhagia, congestion of the lungs (3, 4); Physostigma and pilocarpine poisoning (3, 4, 5); weak heart of fevers, etc., relaxed blood vessels, pneumonia, pleurisy (3); in the eye, to dilate the pupil, to prevent adhesions, to remove congestion, to relieve pain, to give rest (1); any spasm of involuntary muscle fiber (4).

**ATROPINE.****MORPHINE.**

Stimulates respiration.

Depresses respiration.

Dilates pupil.

Contracts pupil.

Reddens skin.

Causes palor.

Increases temperature.

Decreases temperature.

Both lessen peristalsis.

Stimulates kidney.

Depresses kidney.

Lessens sweat.

Increases sweat.

Checks secretion through peripheral nerves.

Checks secretion through centers in the medulla.

Lessens sensation through peripheral nerves.

Lessens sensation through centers and tracts of the

Cerebral excitant (short sleep).

cord.

Cerebral depressant (long sleep).

Contracts arterioles.

Dilates arterioles.

Both relieve pain.

Both cause incoördination of muscles.

Both produce mental confusion.







**STRAMONIUM.**

Its action is identical with that of belladonna, except in the following points:

**Nervous System.** More effect on sympathetic nerves, less on motor and sensory nerves.

**Circulation.** Heart action sometimes irregular.

**Respiration.** Muscle fibers of the bronchial tubes are more relaxed than by the action of belladonna.

**Poison.** Drug causes more delirium than belladonna.

**Administration.** Cigarettes of the leaves should be smoked for asthma. Any of the preparations may be given internally.

**Therapeutics.** It is like belladonna, but is better in spasmodic asthma and painful hemorrhoids.

**Contra Indications.** As for belladonna.

**HYOSCYAMUS. (Henbane.)**

Its action is identical with that of belladonna, except in the following points:

**Internal Action.—Digestive Tract.** Less depressant to peristalsis, but relieves griping more.

**Circulation.** Less powerful than belladonna, more powerful than stramonium.

**Nervous System.** Less powerful cerebral excitant, more powerful hypnotic, cerebral and spinal sedative (hyoscine).

**Respiration.** Less powerful sedative than belladonna.

**Urinary Tract.** More powerful sedative than belladonna.

**HYOSCYAMINE.**

Like atropine, but less powerful, more anodyne and anesthetic than narcotic. Cerebral stimulant, spinal depressant.

**HYOSCINE.**

Cerebral and spinal sedative, hypnotic, depressing the higher centers, and having special effect on motor cord and cerebral cortex.

**Administration.** Any preparations. Begin with small dose. Alkaloids hypodermically or by mouth. Hyoscine is tasteless.

**Therapeutics.** It is like belladonna, but is better in incontinence of urine, vesical tenesmus, etc. For colic to allay griping. For delirium tremens, mania, insomnia, hysterical convulsions, cholera, etc.

**Contra Indications.** As for belladonna.

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**DEPRESSANTS OF THE NERVOUS SYSTEM.****OPIUM.**

*Incompatibles*—Tannic acid, caustic alkalies, metallic salts.

1. **External Action.** Slightly anodyne. On broken skin or mucous membranes it reduces sensitiveness of nerve terminals, and is readily absorbable.

*Antagonists*—Irritants. *Synergists*—Belladonna, cocaine.

2. **Internal Action.** All secretions diminished except sweat. **Digestive Tract.** Mouth. Flow of saliva checked. Stomach and Intestines. All secretions diminished. Medicinal doses lessen peristalsis by stimulation of the inhibitory fibers of the splanchnic nerve; hence constipation. Very large doses, or long continued, paralyze inhibitory fibers; hence diarrhea. Reflex constipation relieved by depressant effect of opium on nerve terminals.

*Antagonists*—Cathartics, strychnine. *Synergists*—Astringents.

3. **Circulation.** Heart. Small doses stimulate inhibitory fibers centrally and peripherally, stimulate heart





muscle and ganglia, hence slow, full, strong pulse; large doses and continued doses depress the inhibitory nerve fibers and heart muscle, hence rapid, weak pulse unless heart muscle is exhausted, when slow, weak pulse results. Vasomotor system. Some dilatation of cutaneous blood vessels, increased arterial tension due to increased heart action. Very large or poisonous doses paralyze the vasomotor system. Habitual use contracts cutaneous blood vessels (pallor).

*Antagonists*—Aconite, antimony, chloroform, nitrites.

*Synergists*—Strychnine, belladonna, caffeine, etc.

**4. Respiration.** The center in the medulla is sometimes stimulated by small doses, large ones depress and paralyze. Death by paralysis of respiration.

*Antagonists*—Belladonna, strychnine, ammonia, caffeine.

*Synergists*—Hydrocyanic acid, chloral, aconite, chloroform.

**5. Nervous System.** Brain. In its general action it is depressant to the brain. Different effects on children, animals and adults. Stimulates higher centers, and increases circulation of the brain, stimulates imagination, and depresses inhibition. This is followed by depression and sleep; dreams, good or bad, caused by depression of cortical cells and anemia of the brain, next it acts on the basal ganglia (vomiting, contracted pupil, etc.). Cord. Short period of stimulation, then depression of sensory tracts, cerebral and spinal centers and nerve terminals; motor tracts at first stimulated, and then depressed (convulsions, inability to stand, etc.), reflexes diminished and abolished, muscles unaffected.

*Antagonists*—Strychnine, belladonna, caffeine, cocaine.

*Synergists*—Chloral, bromides, trional, gelsemium, etc.

**6. Temperature.** Slightly raised by medicinal doses, lowered after diaphoresis and by lethal doses.

7. **Eye.** Pupil contracted probably by the stimulation of the oculo-motor nerve, possibly by the depression of the sympathetic nerve.

8. **Skin.** Sweat glands are stimulated, increasing sweat (probably due to the effects of venous blood on the sweat center).

*Antagonist*—Belladonna. *Synergists*—Ipecac, pilocarpus.

9. **Uterus.** Depressed. Menstruation checked. The drug may cause impotence in males.

*Antagonist*—Emmenagogues. *Synergist*—Viburnum.

10. **Metabolism.** Lessened (less carbon dioxide and urea); liver function impaired, decrease in sugar in diabetes.

11. **Absorption and Elimination.** The drug is quickly absorbed, and is eliminated by the stomach as morphine (lavage); by the milk (new-born children); by the kidneys (effect on urinary tract); by the skin (rash, itching). It is probably partially destroyed in the liver.

**Untoward Action.** Excitement, wakefulness, nausea and vomiting, itching and rash, etc.

**Poisoning.—Acute.** Symptoms. Excitement, then sleep; variable time; patient wakes with dry mouth. Coma, patient roused with difficulty, respiration slow and strong, skin warm and dry, diminished reflexes, prostration, pupils contracted until death approaches, then skin moist and clammy, temperature falls, cyanosis, pulse rapid and feeble, respiration slow and irregular, abolished reflexes. Death is due to respiratory failure, not to sleep.

**Treatment.** Emetics, stomach pump, tannin, potassium permanganate, strychnine, coffee, douches, exercise, flagellation, faradic battery, external heat.

**Chronic.** Symptoms. Nervous tremors and nerv-







ousness, hallucinations, hypochondria, anxiety, insomnia, spasms, neuralgia, neuritis, vesical irritation, constipation or diarrhea, disturbance of sexual functions, mental and moral degeneracy.

**Treatment.** Withdrawal of the drug suddenly or gradually under absolute espionage, tonics, hygiene. (Surgical operations on opium habitues.)

**Administration.** Habit is formed so insidiously that it is best to avoid the use of opium if possible, especially in persons of nervous temperament. Children bear opium very badly. Idiosyncrasy is common with this drug. The drug may accumulate in the system. If prolonged administration is necessary, begin with small dose and increase gradually. Age, sex, condition of the patient influence the action of the drug, so that the dosage and interval of administration cannot be definitely stated.

**Therapeutics.** To relieve pain, to produce sleep, to lessen reflex irritation, to diminish secretion, to produce sweating. Conjunctivitis, painful condition of the urethra, ear, nose and throat (1); delusions of delirium tremens or mania, spasm of involuntary muscles, condition of tetanus, uremia, etc. (5, 11); congestive chill (3, 5); dysentery, cholera morbus, cholera (2); coryza, bronchitis (8, 3); peritonitis (2, 3, 5); shock (3, 4, 5); pleurisy (3, 4); passive hemorrhage (3); debility of fevers (3, 4, 5).

**Contra Indications.** Children, neurotic persons, excessive bronchial secretions of the aged, the second stage of pneumonia, cerebral congestion, alcoholism.

### MORPHINE.

*Incompatibles*—Iodine, iodides, bromine, bromides, Fowler's solution, sodium borate.

Has in general the action of opium, but without its convulsive effects, but with the following differences:

It is less constipating, less stimulating, more sedative, more anodyne, more hypnotic, causes more pruritus.

#### CODEINE.

Less hypnotic than morphine, more stimulant to spinal cord, special sedative to the pneumogastric nerve, hence analgesic to abdominal viscera.

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### HYPNOTICS.

#### CHLORAL.

*Incompatibles*—Alkalies.

Chloral seems at first to produce brief stimulation of the heart and nervous system, but its dominant action is as follows:

1. **External Action.** An irritant to skin and mucous membranes producing burning, ulcerations, vesication, and is also an anesthetic and antiseptic.

*Antagonists*—Emollients. *Synergists*—Local anesthetics and antiseptics.

2. **Internal Action.—Digestive Tract.** In mouth and stomach it causes burning and irritation.

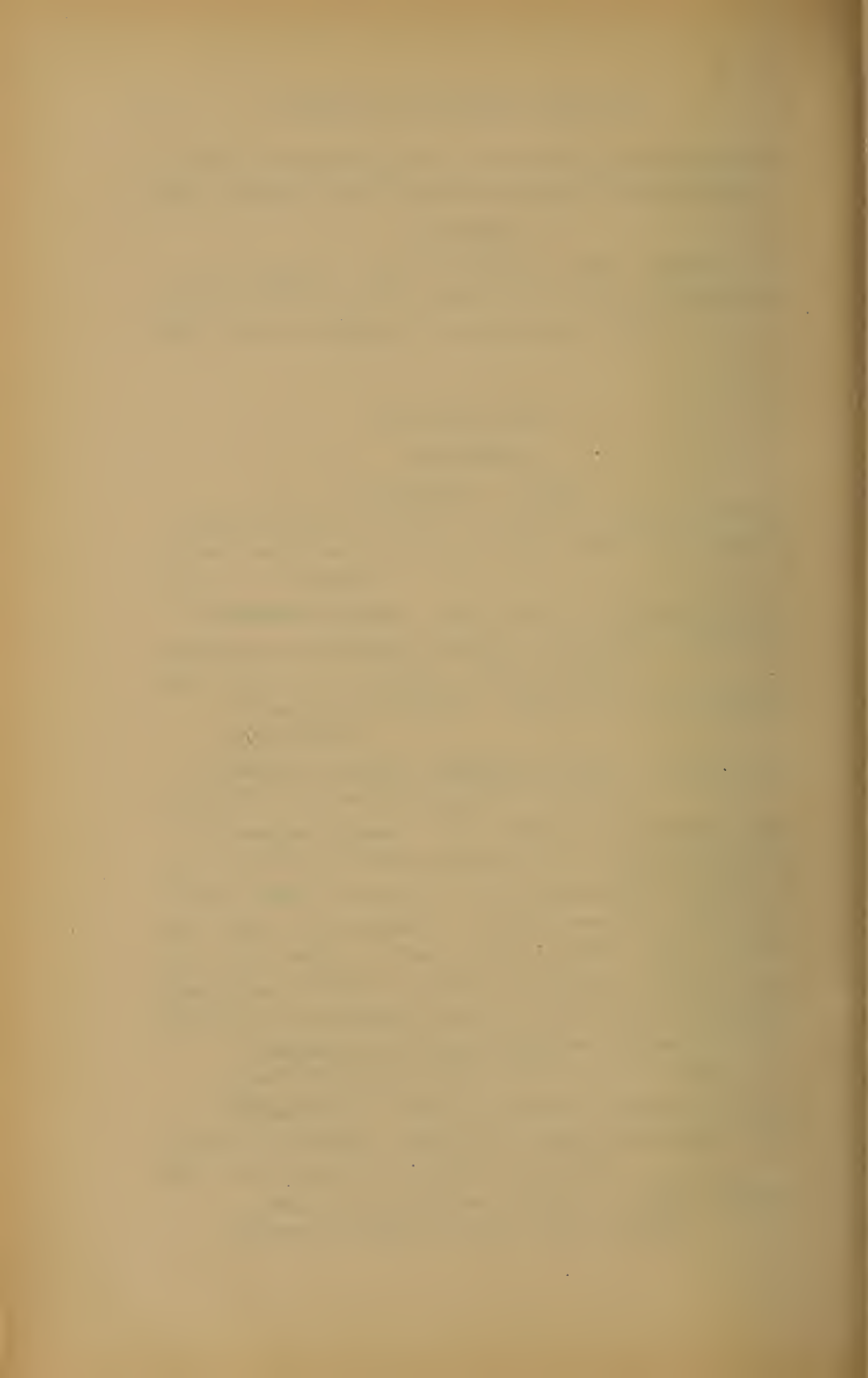
3. **Nervous System.** The drug is a powerful hypnotic, producing natural sleep by its depressant action on the higher centers of the cortex and by anemia of the brain; no headache. It depresses the motor centers and tracts of the cord and the motor nerves, diminished reflexes, sensory receptive centers of the cord may be depressed, but the drug is not an anodyne.

*Antagonists*—Strychnine, belladonna, caffeine, coca. *Synergists*—Bromides, opium, chloroform, physostigma.

4. **Respiration.** Moderate doses produce no effect; large ones depress, the act becoming shallower; toxic doses paralyze the respiratory center.

*Antagonists*—Strychnine, belladonna, caffeine, ammonia. *Synergists*—Hydrocyanic acid, opium, aconite.





5. **Circulation.** Blood. Excessive doses produce crenation of the red blood corpuscles and diminution of the white blood corpuscles. Heart. Small doses have no effect; large doses are depressant to cardiac ganglia and muscles, pulse becoming slow and weak and later weak and running. Arterial tension. Lessened by depression of the vasomotor center and nerves; dilatation of the superficial vessels.

*Antagonists*—Alcohol, ammonia, strychnine, belladonna, morphine, digitalis. *Synergists*—Aconite, chloroform, etc.

6. **Temperature.** Lessened and under large doses markedly reduced; this is due to lessened oxidation of the body cells and increased elimination through the dilatation of the superficial vessels.

7. **Eye.** Continued use causes contracted pupil by paralysis of the sympathetic nerve.

8. **Absorption and Elimination.** The drug is rapidly absorbed, producing effects in from fifteen to thirty minutes. It is partially eliminated by the skin, and may by its irritant action cause erythematous rash, papules and vesicles. Quasi purpura hemorrhagica. It is chiefly eliminated by the kidneys as urochloralic acid, and may produce irritation of the urinary tract, causing bloody urine, etc. Urine responds to Fehling's test for sugar.

**Untoward Action.** Anxiety, restlessness, disturbance of respiration, disturbance of vision, rash.

**Poisoning.—Acute.** Symptoms. Respiration is at first slow and labored, then slow and feeble; circulation is at first slow and then rapid and weak, disappearing at the wrist, face white and livid, body covered with clammy sweat, temperature markedly reduced, pupils contracted, then dilated, muscular relaxation, abolished reflexes. Death by respiratory or cardiac failure.

**Treatment.** Emetics, stomach pump, external heat, keep head low, digitalis, strychnine, atropine, artificial respiration.

**Poisoning.—Chronic.** Symptoms. Anemia, muscular weakness, weak irritable heart, hepatic derangement, vasomotor disturbances (sudden flushings, etc.), respiratory irregularity, mental depression, insomnia, excitable speech and action, insanity.

**Treatment.** Withdrawal of the drug suddenly or gradually, tonics, hygiene.

**Administration.** Children bear chloral fairly well. On account of the irritant qualities of the drug it should be well diluted, using some aromatic liquid to disguise the taste. Administration to be repeated according to indications.

**Therapeutics.** Hydrocele, cancer, foul ulcers, gonorrhea, bromidrosis, hyperidrosis, anal fissure, cracked nipples (1); insomnia, delirium tremens, puerperal mania, uremic convulsions, spasmodic disorders, chorea, whooping-cough, infantile convulsions, asthma, tetanus, hiccough, strychnine poisoning, puerperal convulsions, epilepsy, reflex vomiting, rigid os, labor pains, neuralgia, nervous irritability, restlessness of sthenic fevers, scarlet fever (3).

**Contra Indications.** Fatty heart, weak respiration, acute inflammatory rheumatism, atheromatous blood vessels, neurotic persons.

#### CHLORALAMIDUM.

Compared with chloral.

**External Action.** Less irritating.

**Internal Action.—Digestive Tract.** Like chloral.

**Circulation.** Very feeble action if any.

**Nervous System.** Acts on cerebral cortex like chloral, but is less depressing to motor cord; analgesic.







**Respiration.** Stimulated by small doses, depressed by large.

**Urine.** Diminished.

**Temperature.** Unaffected.

**Poisoning.—Acute.** Like chloral.

**Poisoning.—Chronic.** There is no tendency toward the formation of the habit.

**Therapeutics.** Its action when given internally is like that of chloral. It is also used in neurasthenic insomnia and sea-sickness.

#### CHLORETONE.

**Internal Action.—Stomach.** Sedative to sensory nerve terminals, locally anesthetic.

**Circulation.** Not as depressing as chloral.

**Respiration.** Not as depressing as chloral.

**Nervous System.** Hypnotic like chloral and anesthetic (depression of the sensory nerve terminals?).

#### CHLORALOSE.

Identical in action with chloral, except that it is more depressant to the cerebrum, and is more stimulant to the spinal cord. It is more anodyne than chloral. It is uncertain in its action.

#### CROTON CHLORAL.

Identical in its action with chloral, except it is possibly less depressant to the heart and has a specific action of relieving neuralgia of the fifth nerve.

**Therapeutics.** It is like chloral. It is also used in headache, facial neuralgia and migraine.

#### CAMPHOR CHLORAL.

Used only externally; depresses sensory nerve terminals, anesthetic.

**HYPNAL.**

Like chloral, except that it is more antispasmodic and theoretically more anodyne. It is more irritating to the stomach.

**URETHANE.**

Allied to chloral, but less depressant to circulation and respiration, more depressant to motor nerve terminals, not so reliable as a hypnotic.

**THE BROMIDES.**

*Incompatibles*—Acid and metallic salts, acids; spirit of nitrous ether with ammonium bromide.

**External Action.** None.

1. **Internal Action.—Digestive Tract.** Slightly sedative to pharyngeal mucous membrane, irritant to stomach if continued.

2. **Nervous System.** Depressant to intellectual and motor cortical centers, somnolence; continued use may impair memory and intellect. Cerebral circulation lessened. Depressant to peripheral sensory nerves and tracts in the cord. Later it depresses the motor nerves, diminishes reflexes and depresses sexual functions.

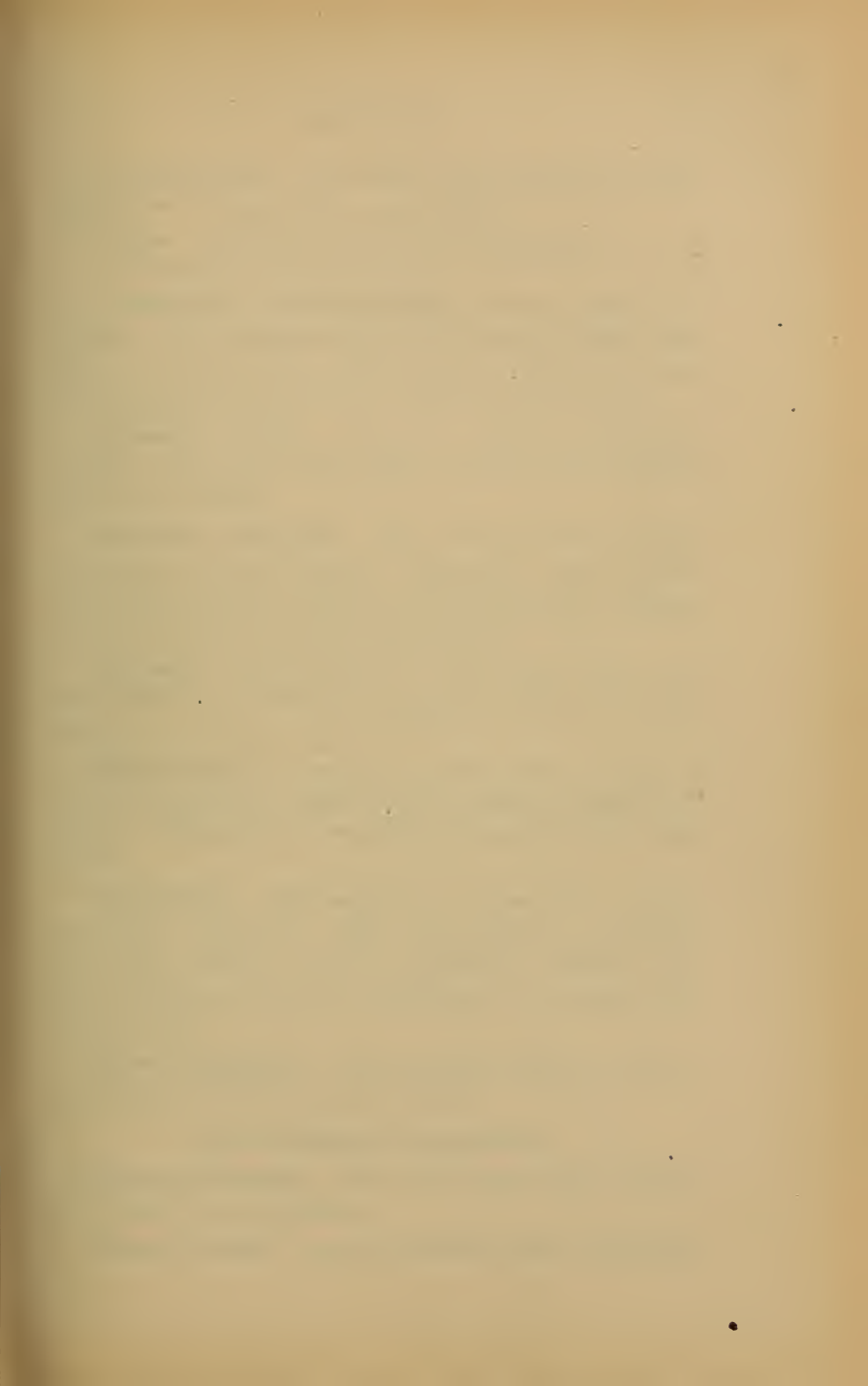
*Antagonists*—Strychnine, caffeine, coca. *Synergists*—Chloral, opium, acetanilia, antipyrin, etc.

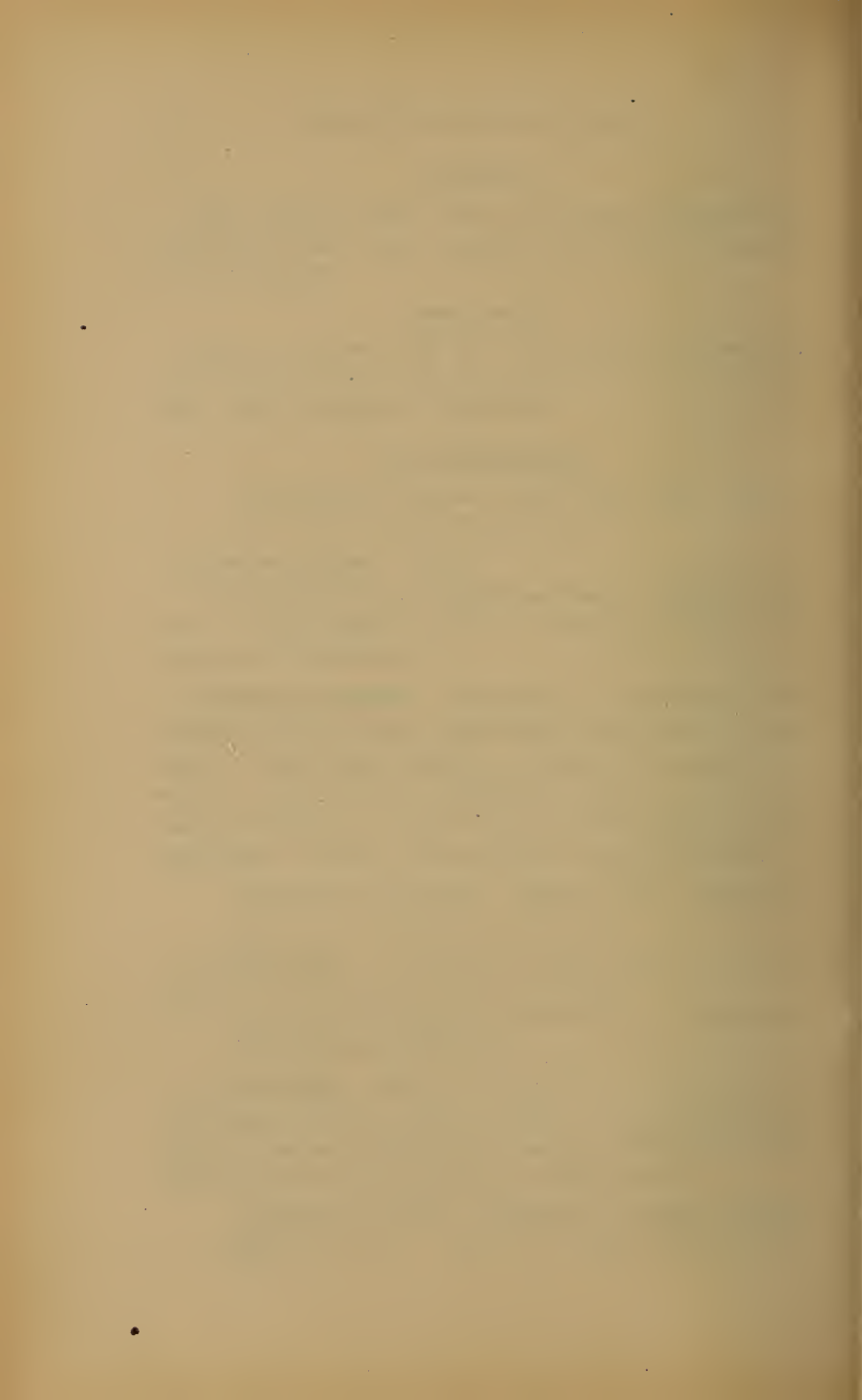
3. **Respiration.** Medicinal doses have no effect. Large doses depress respiratory center.

*Antagonists*—Belladonna, strychnine, etc. *Synergists*—Chloral, aconite, hydrocyanic.

4. **Circulation.** Heart rate and force diminished by depressant action on heart muscle. Large doses lower arterial tension, though the vessels are reduced in size. Therapeutic doses produce no marked effect.

*Antagonists*—Alcohol, belladonna, strychnine, caffeine, digitalis, ergot, etc. *Synergists*—Aconite, nitrites, chloroform, etc.





5. **Temperature.** No marked effect caused by medicinal doses. Large doses cause a fall.

6. **Skin.** Irritated in course of elimination.

*Antagonist*—Fowler's solution.

7. **Absorption and Elimination.** Very rapidly absorbed. It is eliminated by the kidneys chiefly, partially by all avenues. Elimination is slow, therefore there is danger of cumulative effects and bromism.

**Untoward Action.** Nausea, coryza, bronchitis, cough, bad breath, depression of the genito-urinary tract, nervousness.

**Poisoning.—Bromism.** Acne, fetid breath, pallor, emaciation, special senses depressed, motor power diminished, mental dullness, melancholia with suicidal intent, moroseness, mental aberration.

**Treatment.** Withdrawal of the drug, arsenic for acne, salol for intestinal antiseptis, purgatives, stimulants.

**Administration.** Because of the irritant action of these preparations, they should be always given well diluted. Frequency of repetition depends on the conditions.

**Therapeutics.** Pharyngitis (1); insomnia, cerebral congestion, epilepsy, reflex convulsions, strychnine poisoning, tetanus, nervous irritability, delirium tremens, delirium of fevers, cinchonism (2); cardiac irritability (4).

**Contra Indications.** Great debility, anemia, fatty or weak heart and low arterial tension.

#### THE BROMIDES COMPARED.

**Potassium Bromide.** This is the most toxic to heart and muscles, less hypnotic.

**Sodium Bromide.** Is most hypnotic, has more effect

on the circulation, and is less irritant to the stomach than potassium bromide.

**Lithium Bromide.** Resembles the sodium salt, more hypnotic than the potassium salt.

**Ammonium Bromide.** Resembles the potassium salt, but is less depressant to the heart and muscular system.

**Calcium Bromide.** Good hypnotic, less irritant than the potassium salt.

**Strontium Bromide.** Mildest of all, less apt to cause acne.

**Zinc Bromide.** Very irritant.

**Gold Bromide.** Very depressing to cortical cells.

**Dilute Hydrobromic Acid.** Like the bromides, but less depressant and less poisonous.

#### SULPHONAL.

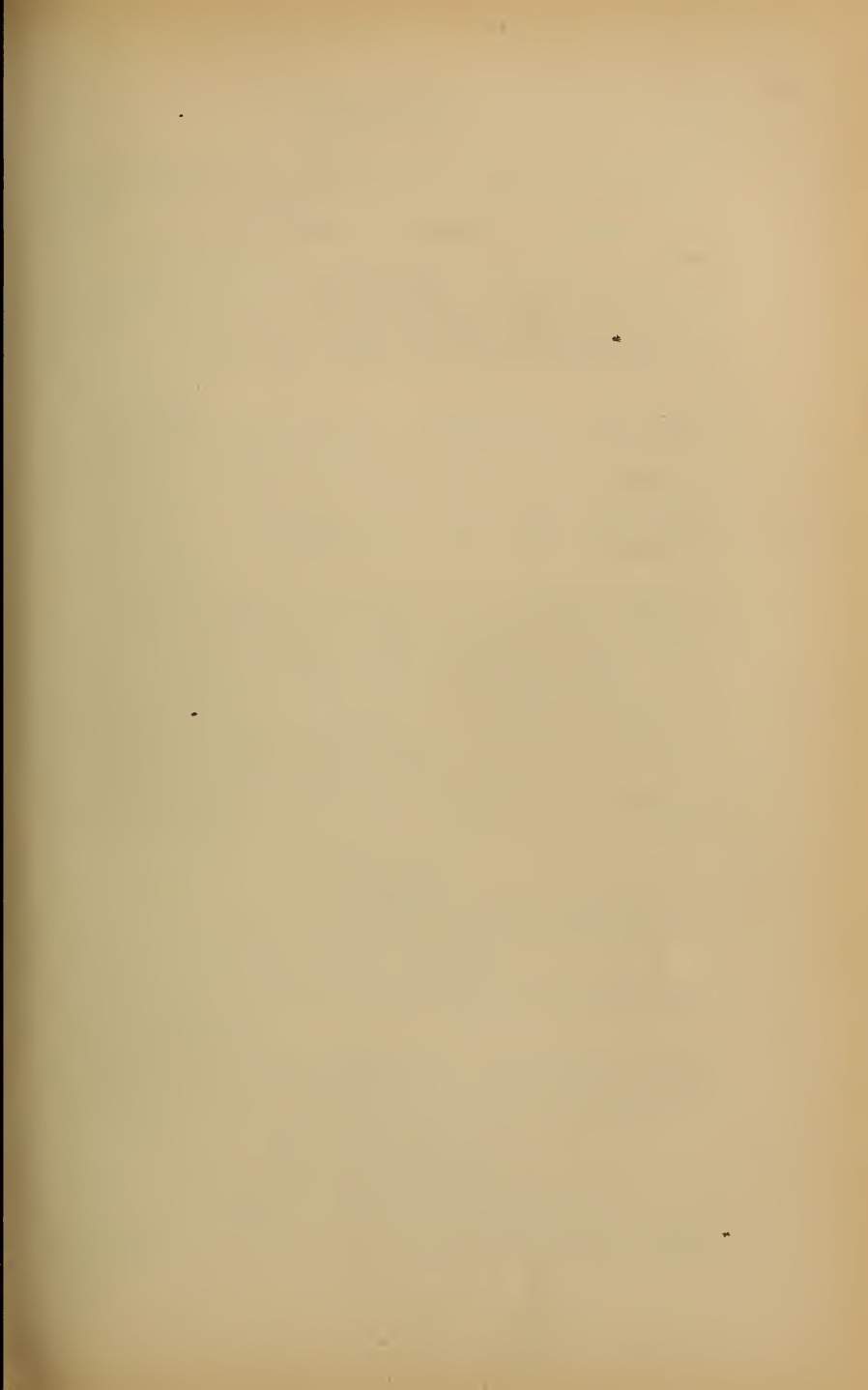
*Incompatibles*—None specially. Drug usually given alone.

1. **Internal Action.—Digestive Tract.** Medicinal doses have no effect. Toxic doses may cause nausea, vomiting and gastric pain.

2. **Nervous System.** The higher centers of the brain are depressed, producing sleep. Motor nerves are not affected, but the drug may produce a staggering gait and muscular relaxation. Sensory nerves are unaffected. Sleep is quiet, but giddiness or drowsiness is apt to ensue the next day. Reflex excitability lessened by stimulation of the reflex inhibitory center.

*Antagonists*—Caffeine, coca, alcohol, etc. *Synergists*—Chloral, opium, bromides, etc.; antispasmodics.

3. **Circulation.** Usually is unaffected, but it may cause a slight rise in arterial tension, and slightly increase the cardiac action.







4. **Respiration.** Medicinal doses produce no effect; full doses may depress.

*Antagonists*—Respiratory stimulants. *Synergists*—Respiratory depressants.

5. **Absorption and Elimination.** Absorption is very slow. The drug is largely changed in the body, but if given in large doses, may be partially eliminated by the kidneys.

**Poisoning.** Symptoms. Derangement of the digestive tract, vertigo, weakness, tremor of the limbs, incapability for mental or physical work, drowsiness, diminished urine, casts, blood, hematoporphyrinuria.

**Treatment.** Withdrawal of the drug, stimulants, tonics, etc.

**Administration.** Prolonged use diminishes hypnotic effect. Action of the drug is slow and prolonged, taking from two to four hours to produce effect. The dose is difficult to determine. It should always be given in powder or capsules with hot milk or whiskey to hurry absorption and effects.

**Therapeutics.** Insomnia, excitement of insanity, nervous irritability (2).

#### TRIONAL.

Action is not well understood. It is depressant to the cortical areas of the brain, producing sleep. Diminishes arterial tension somewhat.

**Poisoning.** Symptoms and treatment are the same as for sulphonal.

**Comparison with Sulphonal.** Its action is much more prompt, effects observed in about one hour, and the effects are not so long continued.

#### HUMULUS. (Hops.)

*Incompatibles*—Mineral acids, metallic salts.

I. **External Action.** It is mildly sedative and astringent.

2. **Internal Action.—Digestive Tract.** It is like the bitters stimulating salivary and gastric glands.

*Antagonists*—Opium, belladonna, gastric sedatives. *Synergists*—Strychnine, bitters, etc.

3. **Circulation.** Heart rate and arterial tension are increased slightly.

4. **Nervous System.** At first mildly stimulant, and then mildly sedative to brain (soporific), the action of the alcoholic preparations is more pronounced.

*Antagonists*—Strychnine, caffeine, coca. *Synergists*—Hypnotics.

5. **Respiration.** It is slightly stimulated.

6. **Absorption and Elimination.** The drug is rapidly absorbed, and is eliminated by the skin and kidneys, stimulating their function.

**Administration.** Tincture, fluid extract and syrup are usual forms in which this drug is administered. Give lupulin in pills.

**Therapeutics.** Orchitis, ear-ache (1); atonic dyspepsia, flatulent colic (2); alcoholism, delirium tremens (4).

#### PARALDEHYDUM.

**External Action.** Mildly antiseptic.

**Internal Action.—Digestive Tract.** It often irritates. Has unpleasant taste.

**Circulation.** It tends to slow and to strengthen the pulse. Toxic doses depress.

**Nervous System.** Like chloral, but the effects are of shorter duration, and there are no bad after effects.

**Temperature.** Is slightly lowered.

**Respiration.** Its effects on respiration are like those of chloral, but it is not so depressing. Toxic doses cause death by paralysis of the respiratory center.





**Absorption and Elimination.** It is rapidly absorbed and is eliminated by the kidneys and the lungs.

**Poisoning.** Like chloral.

**Administration.** Give in capsules, flavored water or in milk.

**Therapeutics.** Like chloral.

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## ANALGESICS.

### ACETANILID.

*Incompatibles*—Potassium and sodium hydrates, chloroform.

1. **External Action.** Mildly sedative, antiseptic and anesthetic. Astringent to mucous membranes.

. *Antagonists*—Irritants. *Synergists*—Cocaine, aconite, etc.

2. **Internal Action.** Mildly sedative to the gastric mucous membrane.

*Antagonists*—Irritants. *Synergists*—Cocaine, aconite, hydrocyanic acid.

3. **Circulation.** Heart. Medicinal doses produce no effect; large doses depress. Arterial tension. Lowered by large doses through paralysis of the vasomotor center. Blood. Medicinal doses produce no change unless through idiosyncrasy. Under large doses it turns brownish, methemoglobin is formed, the oxidizing and oxygen carrying power of the blood is diminished and normal alkalinity is decreased.

*Antagonists*—Strychnine, belladonna, caffeine, digitalis, etc. *Synergists*—Aconite, chloral, etc.

4. **Nervous System.** Depressant to sensory nerves and to cord (analgesic and lessened reflexes). Toxic doses abolish reflexes and paralyze both sensory and motor tracts.

*Antagonists*—Strychnine, caffeine, etc. *Synergists*—Opium, chloral, bromides, etc.

5. **Respiration.** Moderate doses have no effect. Large doses cause rapid impaired breathing, due to condition of the blood, paralysis of peripheral motor nerves, and depression of the respiratory center. Death by respiratory paralysis.

*Antagonists*—Belladonna, strychnine, caffeine, ammonia.

*Synergists*—Hydrocyanic acid, opium, etc.

6. **Temperature.** No effect on normal temperature by medicinal doses. In fever temperature falls rapidly, due to action on the thermogenic center (not by effect on blood, not by sweating).

7. **Skin.** Free diaphoresis.

*Antagonist*—Belladonna. *Synergists*—Pilocarpus, opium, etc.

8. **Absorption and Elimination.** The drug is rapidly absorbed, effects being produced in half an hour. It is eliminated by the kidneys, acting as a diuretic, and causing an increase in urea and uric acid.

**Untoward Action.** Cyanosis, anxious expression, rash, sneezing, prolonged use may cause congestion of the internal organs and fatty degeneration.

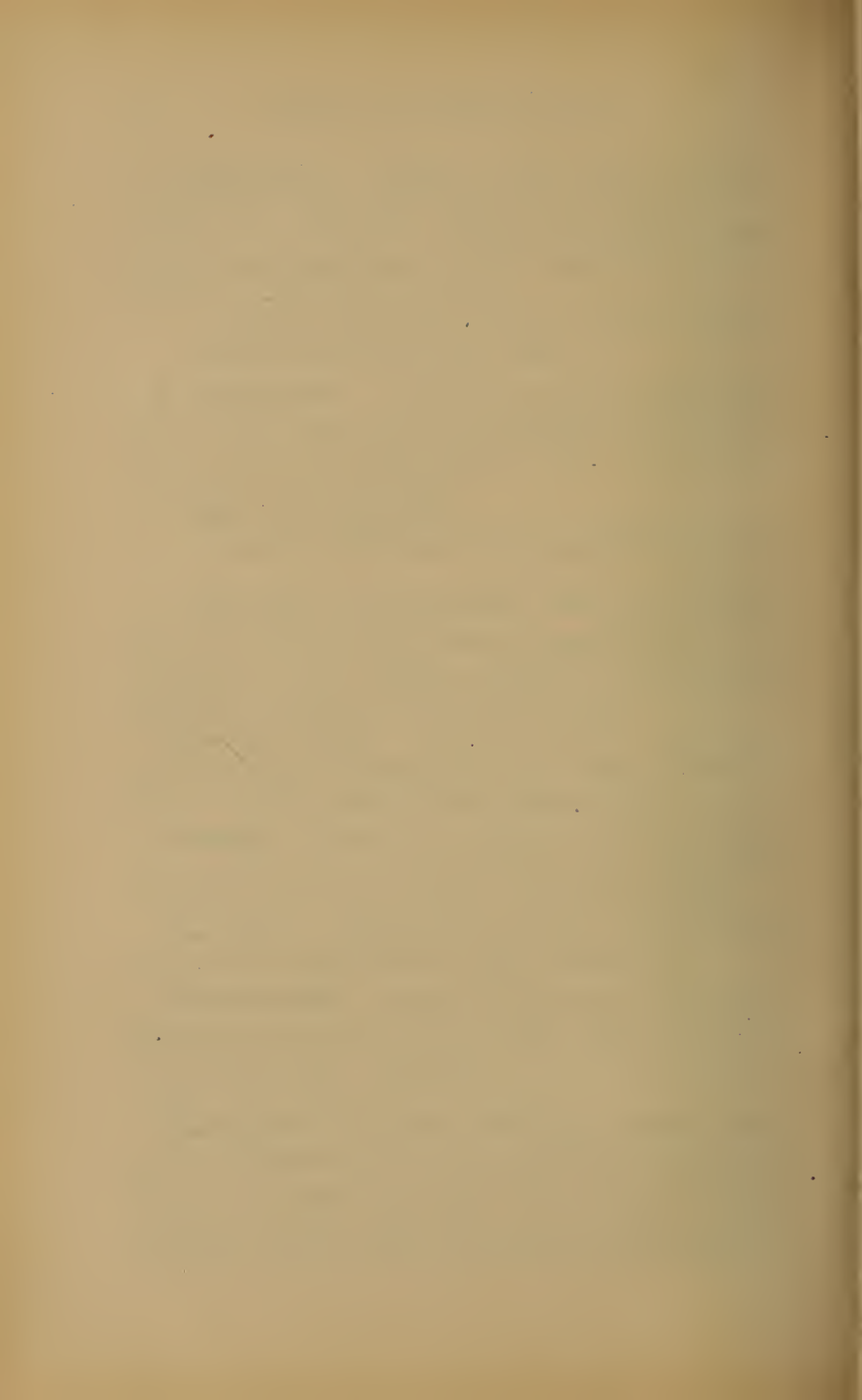
**Poisoning.** Symptoms. Cyanosis, anxious expression, profuse cold sweat, vomiting, slow weak pulse, respiration rapid and labored, or slow and shallow.

**Treatment.** Diffusible stimulants, circulatory and respiratory, external heat, oxygen inhalations.

**Administration.** All drugs of this class must be carefully used on account of the possible depressant effects to circulation and respiration. They may be administered every three to four hours.

**Therapeutics.** Chancre, chancroid, epistaxis, hemoptysis, congestion of the nose and throat (1); sthenic fevers (6); rheumatism, locomotor-ataxia, neuralgias, neuritis, lumbago, gastralgia, dysmenorrhea, sciatica, headache, chorea, epilepsy, whooping-cough, grippe (4).







**Contra Indications.** Low fevers, fatty heart, blood disorders, exhausted condition.

### ANTIPYRIN.

*Incompatibles*—Nitrous compounds, chlorides of mercury, iodides of arsenic and mercury, iodine, ferric salts, carbolic acid, chloral, sodium bicarbonate and salicylate, salts of quinine and caffeine.

**External Action.** Local anesthetic, hemostatic, antiseptic.

**Internal Action.** Like acetanilid, except in the following points: It is irritating to the stomach and digestive tract; this irritation may cause nausea and vomiting.

**Respiration.** Rate is increased by medicinal doses.

**Absorption and Elimination.** More rapidly eliminated than acetanilid, diminishes the amount of urea and uric acid.

*Antagonists and Synergists* as for Acetanilid.

**Administration.** In powders, capsules or in solution.

**Therapeutics.** Like acetanilid, but is a more powerful antiseptic, local anesthetic and analgesic. Diabetes mellitus, intermittent fevers.

### PHENACETIN.

Action not well understood; like acetanilid, except in the following points:

**Circulation.** Small doses raise force and rate of heart beat, and cause a rise in the arterial tension.

**Kidneys.** Not so actively diuretic. Large doses render urine dark and yellow, and produce the reaction of the sugar test. Less powerful analgesic, slow antipyretic.

Administration, therapeutics and contra indications like acetanilid.

**PHENOCOLL HYDROCHLORIDE,***Incompatibles*—Alkalies.

Like acetanilid, except in the following points:

It does not disintegrate the blood, reduces fever markedly, but without profuse sweating.

**Administration.** Give in powders or in capsules or in solution.

**Therapeutics.** It ranks next to quinine as an anti-periodic, without the unpleasant after effects.

**EXALGIN.**

Compared with acetanilid, it is less antipyretic, increasing arterial tension. It is unsafe.

**Administration.** Not oftener than every six to eight hours.

**Therapeutics.** Like acetanilid.

**Contra Indications.** Fever and like acetanilid.

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**MOTOR DEPRESSANTS.****PHYSOSTIGMA.***Incompatibles*—Caustic alkalies, tannic acid.

1. **External Action.** Skin, no effect. Eye, contracts pupil and causes spasm of the ciliary muscle through irritation of the third nerve and paralysis of the ends of the sympathetic nerve; fall of intra-ocular tension (lessened secretion, contracted pupils, contracted vessels); myopia.

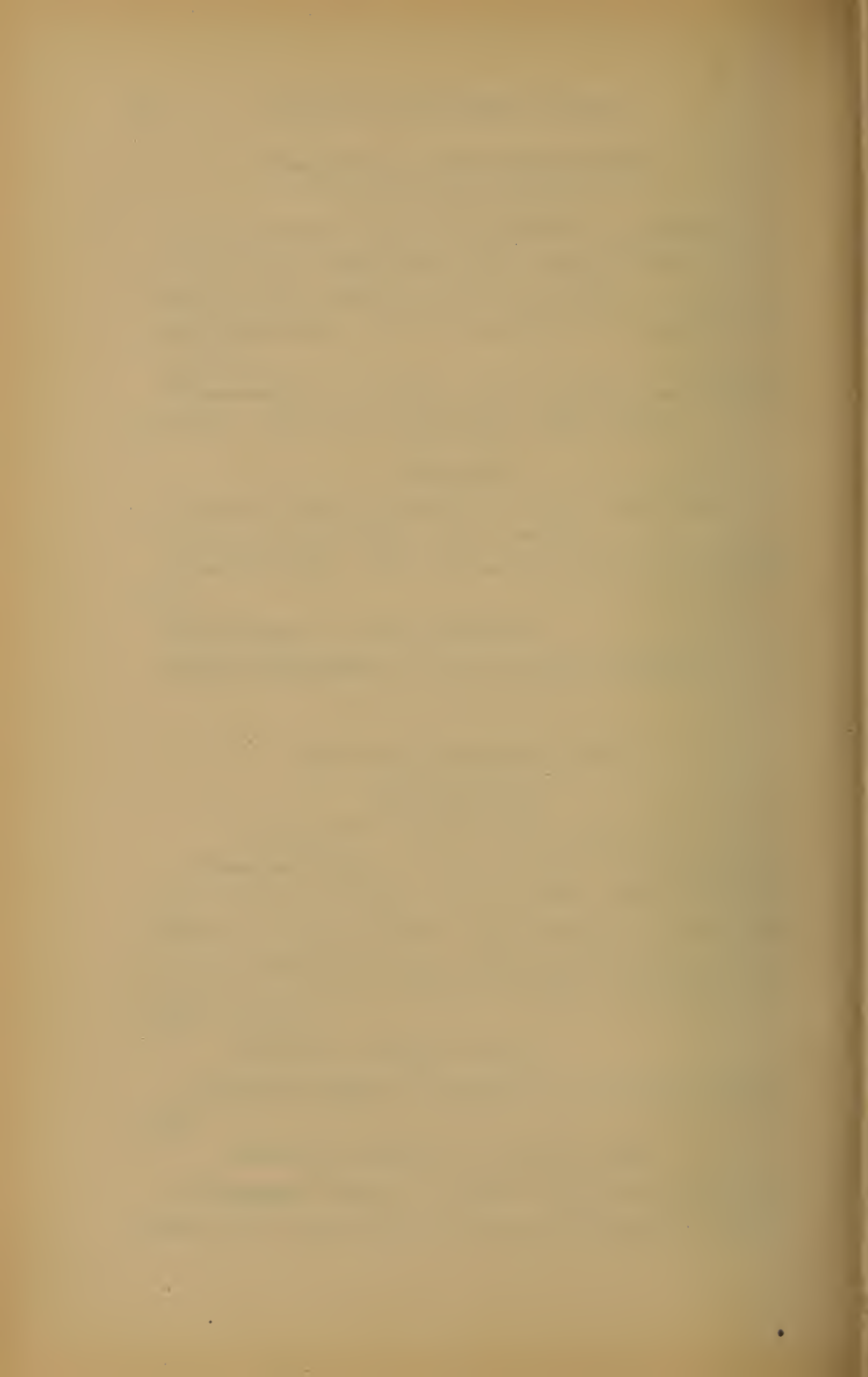
*Antagonists*—Atropine, cocaine.

2. **Internal Action.** Stimulant to unstriated muscle fiber.

*Antagonist*—Belladonna. *Synergist*—Ergot.

3. **Digestive Tract.** At first stimulant to salivary, gastric and intestinal secretions, followed by dimin-





ished secretions. May cause nausea and vomiting. stimulates muscular coat of the stomach and intestines, thus increasing peristalsis—diarrhea.

*Antagonists*—Belladonna, opium, etc. *Synergists*—Alcohol, bitters, strychnine.

4. **Nervous System.** Brain, unaffected. Cord, depression of the motor tracts and centers, diminished reflexes; muscles unaffected, but a sense of muscular debility is felt.

*Antagonists*—Strychnine, coca, caffeine. *Synergists*—Choral, bromides, gelsemium, opium, etc.

5. **Circulation.** Blood, unaffected. Heart, slowed by stimulation of the peripheral endings of the vagus. Force of contractions increased by stimulation of the heart muscles; arterial tension is raised by increased heart force and stimulation of the muscles in the artery walls. Overdose causes depression of the circulation.

*Antagonists*—Nitrites, aconite, veratrum. *Synergists*—Belladonna, ergot, heart stimulants.

6. **Respiration.** No marked effect produced by moderate doses. Under large doses, action is at first increased, and then diminished. Respiratory center is depressed. Death by asphyxia or respiratory paralysis.

7. **Uterus.** Full doses produce contraction.

*Antagonist*—Viburnum. *Synergists*—Ergot, quinine.

8. **Absorption and Elimination.** The drug is rapidly absorbed, and is eliminated by the kidneys, bile and saliva.

**Untoward Action.** Used in the eye may cause pain resembling migraine; internally may produce nausea, general uneasiness, or epigastric pain.

**Poisoning.** Symptoms, muscular tremors, relaxation, reflexes abolished, respiration slow, pupils contracted, cardiac action depressed, vomiting or purging, free sweating, salivation.

**Treatment.** Atropine, diffusible heart stimulants, tannic acid, stomach pump, external heat.

**Administration.** Extract and tincture are most commonly used. Doses at four to six hour intervals. Eserine locally in eye.

**Therapeutics.** Certain diseases of the eye (1); atonic constipation, flatulence, gastric and intestinal dilatation (2, 3); dilatation of the bronchi, bronchial asthma, emphysema (2); tetanus, chorea, epilepsy (4); night sweats of phthisis, renal hemorrhage (5).

**Contra Indications.** Great debility, arrhythmical heart action, condition of extreme high arterial tension.

#### GELSEMIUM.

*Incompatibles*—Tannic acid, caustic alkalies.

1. **External Action.** Mildly sedative and astringent to the skin.

2. **Internal Action.—Digestive Tract.** Slightly irritant to the mucous membrane.

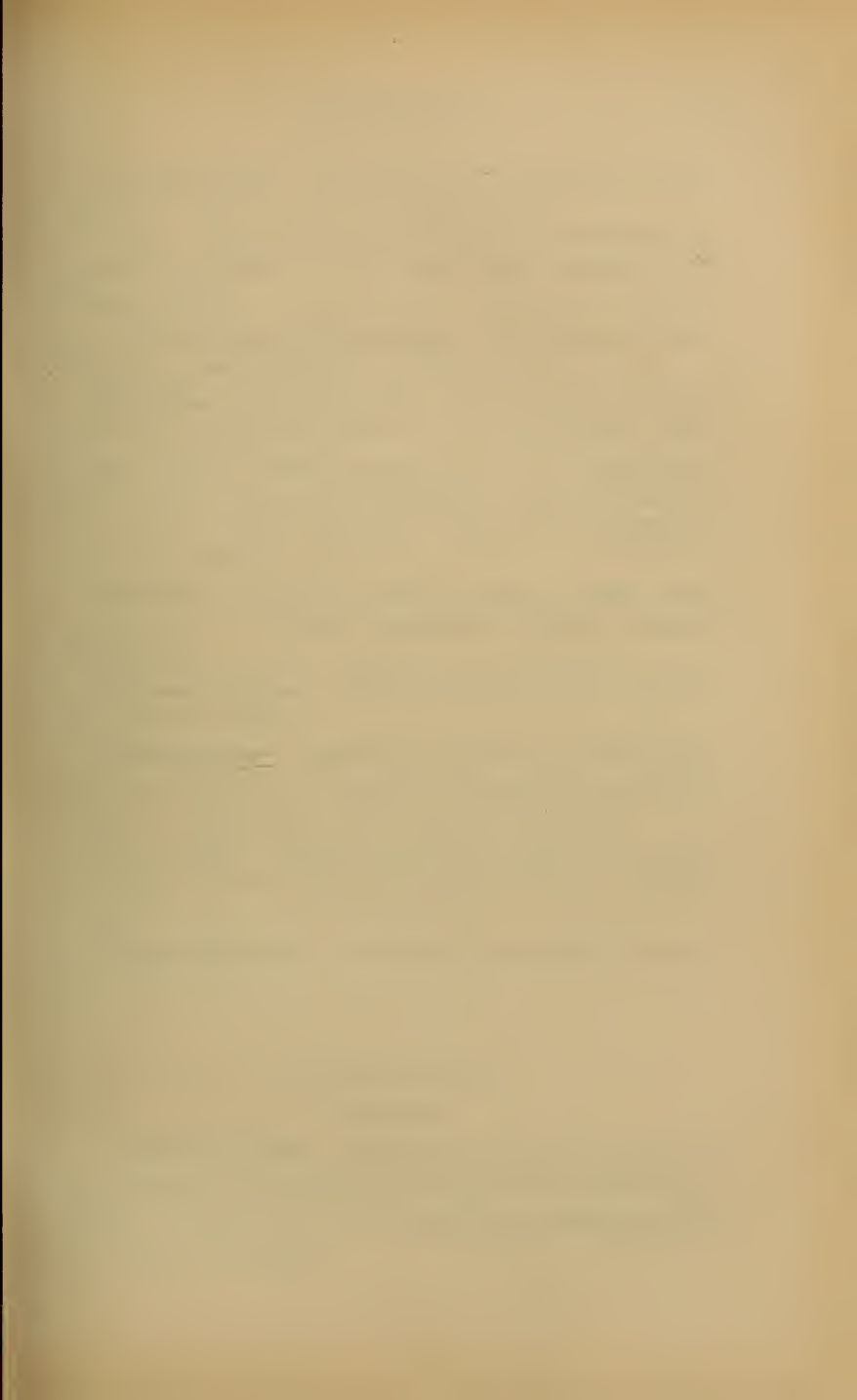
3. **Circulation.** Medicinal doses have no marked effect; toxic doses render pulse slow and weak, and lessen arterial tension.

4. **Nervous System.** Cerebrum, no effect. Large doses paralyze motor areas of the cord, producing paralysis of the muscles. Later cutaneous anesthesia is due to paralysis of the sensory tracts of the cord. (Action on the nervous system is not definitely settled.)

*Antagonists*—Strychnine, belladonna. *Synergists*—Physo stigma, hydrocyanic acid, chloral, etc.

5. **Respiration.** Small doses stimulate, quickening the action; large doses depress, respiration becoming slow and shallow, and finally paralyzed.

*Antagonists*—Strychnine, belladonna. *Synergists*—Hydrocyanic acid, aconite, etc.







6. **Temperature.** Medicinal doses have no effect, poisonous doses reduce the temperature.

7. **Eye.** Paralysis of the third nerve (mydriasis and ptosis) sometimes of the sixth nerve (strabismus), double vision.

8. **Absorption and Elimination.** The drug is rapidly absorbed, and eliminated by the kidneys.

**Poisoning.** Drooping lids, dilated pupils, dimness of vision, muscular weakness and incoördination, abolished reflexes, difficult speech, lowered temperature, cold surface, cutaneous anesthesia, reduced pulse and respiration; mind unaffected. Death from respiratory or cardiac failure.

**Treatment.** Stomach pump, emetics, tannic acid, external heat, diffusible stimulants, atropine, artificial respiration.

**Untoward Action.** Similar to symptoms of poisoning, though milder.

**Administration.** Initial dose small, increasing gradually until dilatation of pupil or drooping of eye-lid is evident. Administer every three to six hours.

**Therapeutics.** Tetanus, paralysis agitans, tri-facial neuralgia, ovarian neuritis, dysmenorrhea (4); pruritis, eczema (1, 4).

**Contra Indications.** Condition of physical weakness and weak heart.

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## ANESTHETICS.

### AETHER.

1. **External Action.** Applied to the skin and allowed to evaporate, it is refrigerant, and produces local anesthesia. Confined, it is an irritant and rubefacient, and may cause vesication.

2. **Internal Action.** Resembles alcohol, but the effects are not so lasting.

**Digestive Tract.** The drug is an irritant to mucous membranes, and may cause spasmodic closure of the glottis. It stimulates the secretions of pancreas, salivary and gastric glands. Increases local circulation, carminative.

*Antagonist*—Opium. *Synergists*—Volatile oils, bitters, etc.

3. **Nervous System.** At first stimulant, then depressant; acts in order on the brain, sensory centers of the cord, motor centers of the cord, sensory centers of the medulla, and finally motor centers of the medulla; succeeded by respiratory paralysis.

*Antagonists*—Strychnine, belladonna, caffeine, etc. *Synergists*—Chloroform, etc.

4. **Circulation.** Acts, at first, by reflex action, and later directly as diffusible, rapid, but fleeting stimulant to heart (increasing pulse and heart force), and to vasomotor centers (increasing arterial tension). Overdose is a cardiac depressant. It decreases hemoglobin and red blood cells.

*Antagonists*—Aconite, veratrum, chloroform, etc. *Synergists*—Alcohol, ammonia, strychnine, digitalis, belladonna, etc.

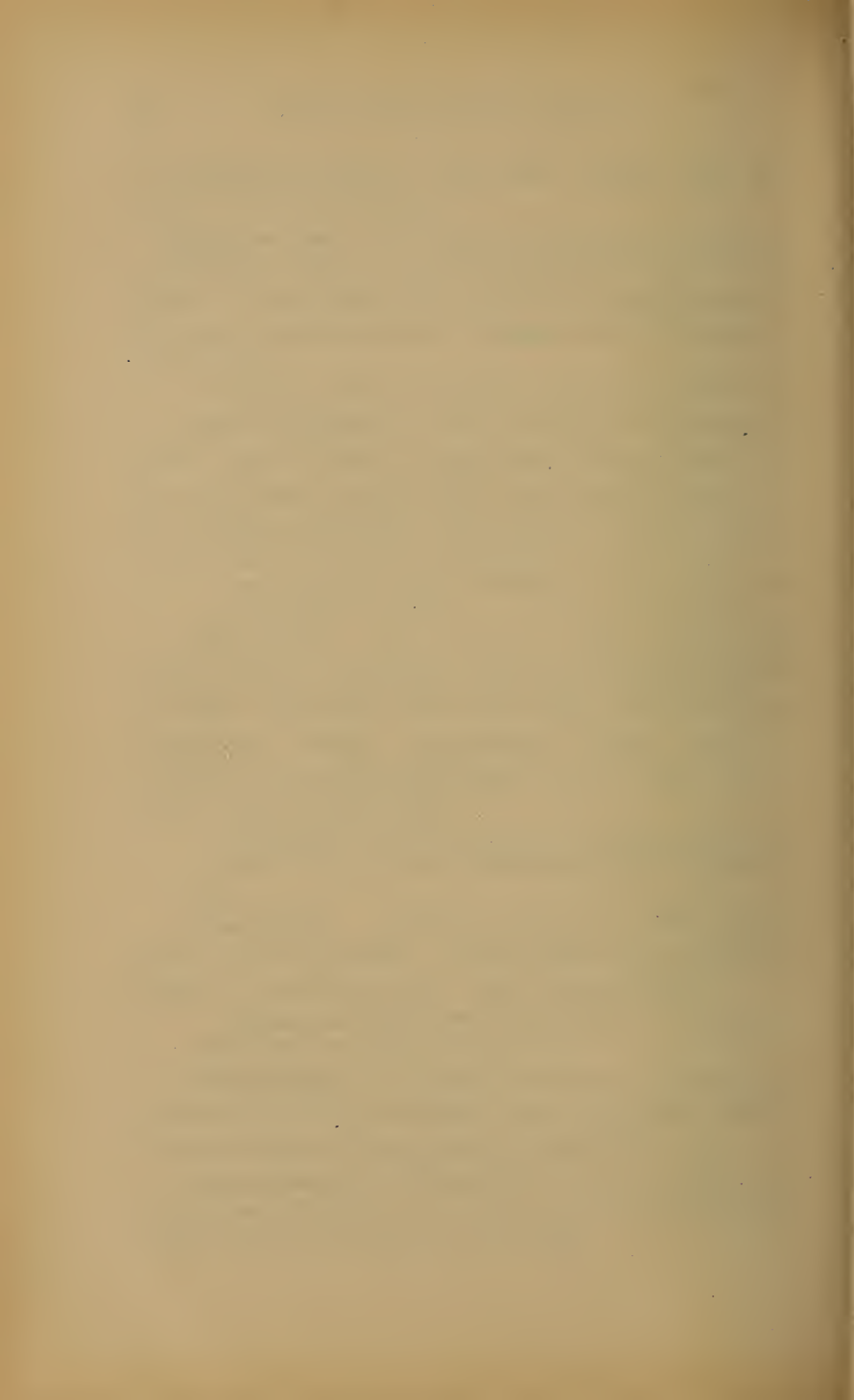
5. **Respiration.** Arrested at first by reflex spasm due to local irritation. It stimulates the respiratory action in medicinal doses; large doses depress.

*Antagonists*—Hydrocyanic acid, chloral, etc. *Synergists*—Belladonna, strychnine, caffeine, etc.

6. **Temperature.** Is lowered markedly, partially by depression of the circulation and respiration, chiefly by the chilling of the lungs and evaporation.

7. **Absorption and Elimination.** Both are rapid. It is eliminated chiefly by the lungs, also by the kidneys, which are often irritated by the drug.





**Administration.** When given by the mouth the drug should be well diluted with ice-cold water to prevent irritation of the passages. Administered by inhalation, air should be excluded, but this should be done gradually, in order to accustom the patient to the drug, and so prevent reflex spasm of the glottis.

**Precautions.** Smear the face with vaseline to prevent irritation, never administer on full stomach, remove artificial teeth and tobacco, have clothing loose about the neck and chest, use only official ether, do not give when actual cautery is to be used, avoid exposure, and protect body heat, never give to young women except in the presence of witnesses. Death is caused by respiratory failure, hence watch for cyanosis, and remember that general anesthesia is a dangerous state, therefore do not leave the patient. Watch the diaphragmatic function as shown by the movement of the abdominal walls. This is the part in which the respiratory functions first fail in ether poisoning and cessation of action here should occasion the immediate withdrawal of the drug.

**General Anesthesia.** At first restlessness followed by quiet, with slow, full breathing, and quick, strong pulse, then follows emotional excitement, with flushed face, distended veins in the neck. This is followed by the stage of anesthesia in which there is a loss of sensation, unconsciousness, abolished reflexes, relaxed muscles, contracted pupils (later dilating), respiration at first slow and deep, later weak.

**Treatment of Accidents.** When cardiac failure threatens (face pale), lower the head; flushed cyanosed face indicates respiratory, not cardiac failure. When respiration ceases early from mechanical obstruction, ether may be used hypodermically to stimulate reflexly, but never when respiratory cessation is

due to poisoning by the drug. Ether may be used externally on the chest at any time instead of water, as it does not wet the clothes. Alcohol must not be used, as its action is too closely allied to that of ether. Rhythmical traction on the tongue eleven to fourteen times per minute may stimulate diaphragmatic action. Use strychnine, digitalis, external heat, artificial respiration, forcible dilatation of rectum.

**After Effects.** Nausea, vomiting, bronchitis, anuria, nephritis.

**Therapeutics.** Pruritus, urticaria and other skin diseases, neuralgia, sciatica (1); shock (4); surgical examinations and operations, obstetrics (3); gastralgia, flatulent colic (2); hysteria, restlessness, insomnia, nausea, hiccough (3); palpitation of the heart, angina pectoris (3, 4); tape worm.

**Contra Indications.** Diseases of the kidneys and of the lungs, dilated or fatty heart, brain tumors, atheromatous arteries, enlarged tonsils, chronic alcoholism, aneurism.

### CHLOROFORM.

1. **External Action.** It is an irritant to the skin, even during evaporation; confined, it will cause vesication, and if applied to very sensitive areas of the body may cause pain. The drug is not so irritant to mucous membranes as ether when inhaled (mixed with air).

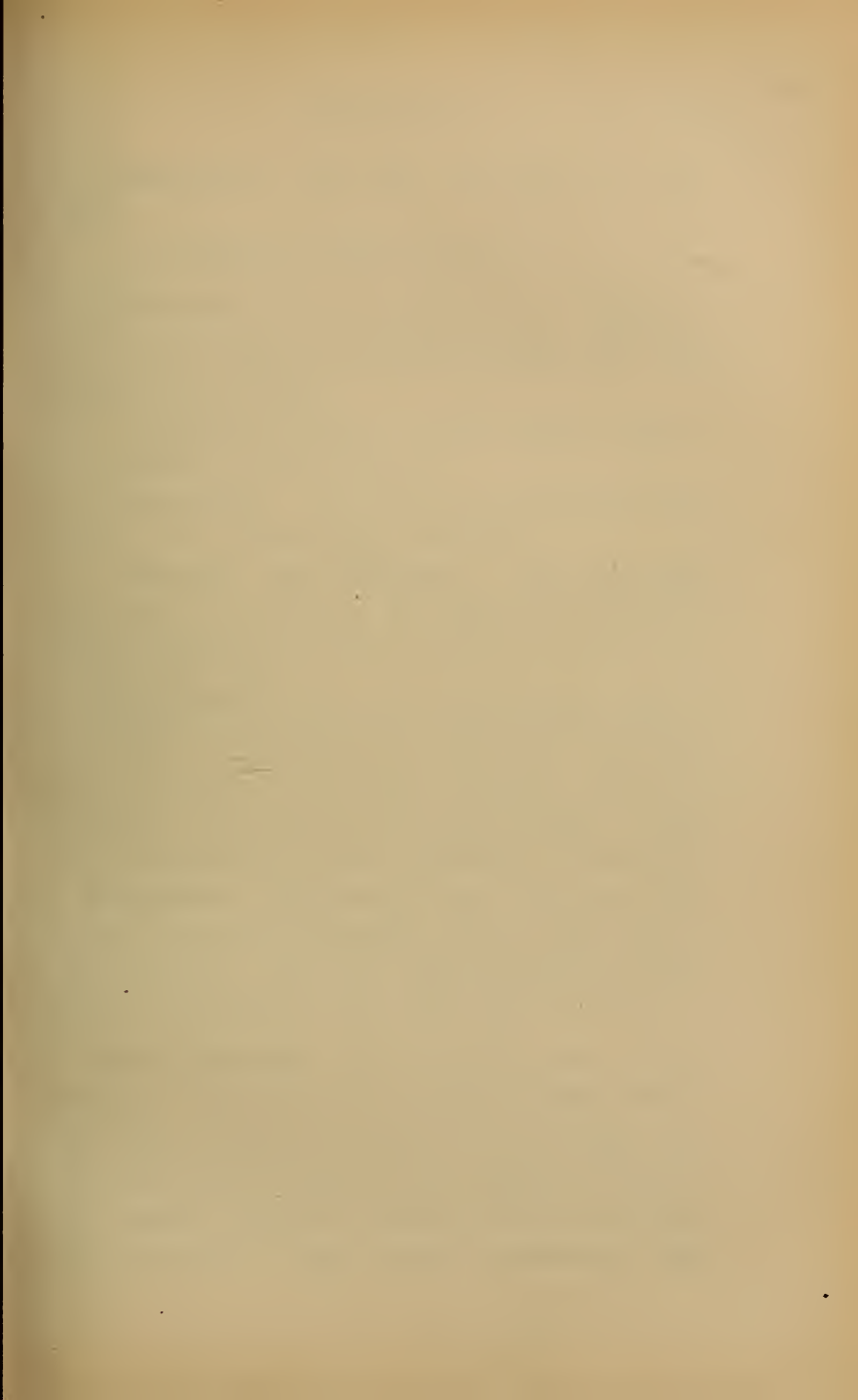
*Antagonists*—Emollients. *Synergists*—Irritants.

2. **Internal Action.—Digestive Tract.** Like ether, but very irritant if concentrated.

*Antagonist*—Opium. *Synergists*—Volatile oils, bitters, etc.

3. **Nervous System.** Like ether. Death usually due to vasomotor paralysis.

*Antagonists*—Strychnine, belladonna, caffeine. *Synergists*—Ether, etc.







4. **Respiration.** Like ether, but effects are more rapid.

*Antagonists*—Hydrocyanic acid, chloral, etc. *Synergists*—Belladonna, strychnine, caffeine.

5. **Circulation.** No effect on the blood. Depressant to the heart muscle and vasomotor center. Death due to vasomotor paralysis, producing anemia of the vital centers in the medulla.

*Antagonists*—Belladonna, strychnine, digitalis, ergot, etc. *Synergists*—Nitrites, aconite, etc.

6. **Temperature.** Is lowered by lessened heat production and increased heat elimination.

7. **Absorption and Elimination.** Both are rapid. The drug is eliminated by the lungs and kidneys, and while sometimes irritating the kidneys, it is much less irritant than ether.

**Administration.** Given internally the drug must be well diluted, administered by inhalation it must be well mixed with air, the cone being held away from the face. The rate and depth of respiration will be an indication of the amount of the drug utilized. There is no immunity by frequent repetitions of chloroform.

**Precautions.** Like those for ether, except that chloroform, being non-inflammable, may be used with an actual cautery. Watch pulse, particularly the tension, and the respiration, which early shows alteration in local circulation about the vital center.

**General Anesthesia.** No spasms as in ether. There may be excitement at first as in ether, though often it is absent. Respiration and circulation at first strong, then consciousness and sensation become obliterated, and if the drug is pushed, utter abolition of reflexes, and complete muscular relaxation occur, with stertorous breathing or rapid, shallow respiration; weak

heart. The pupils are contracted during anesthesia; sudden dilatation is a danger signal. Loss of corneal reflexes indicates, usually, full anesthesia.

**Accidents.** Where idiosyncrasy exists for chloroform, sudden death may occur early in the administration. Cessation of breathing early in the administration is usually due to too great concentration of the drug, or to mechanical interference by the tongue.

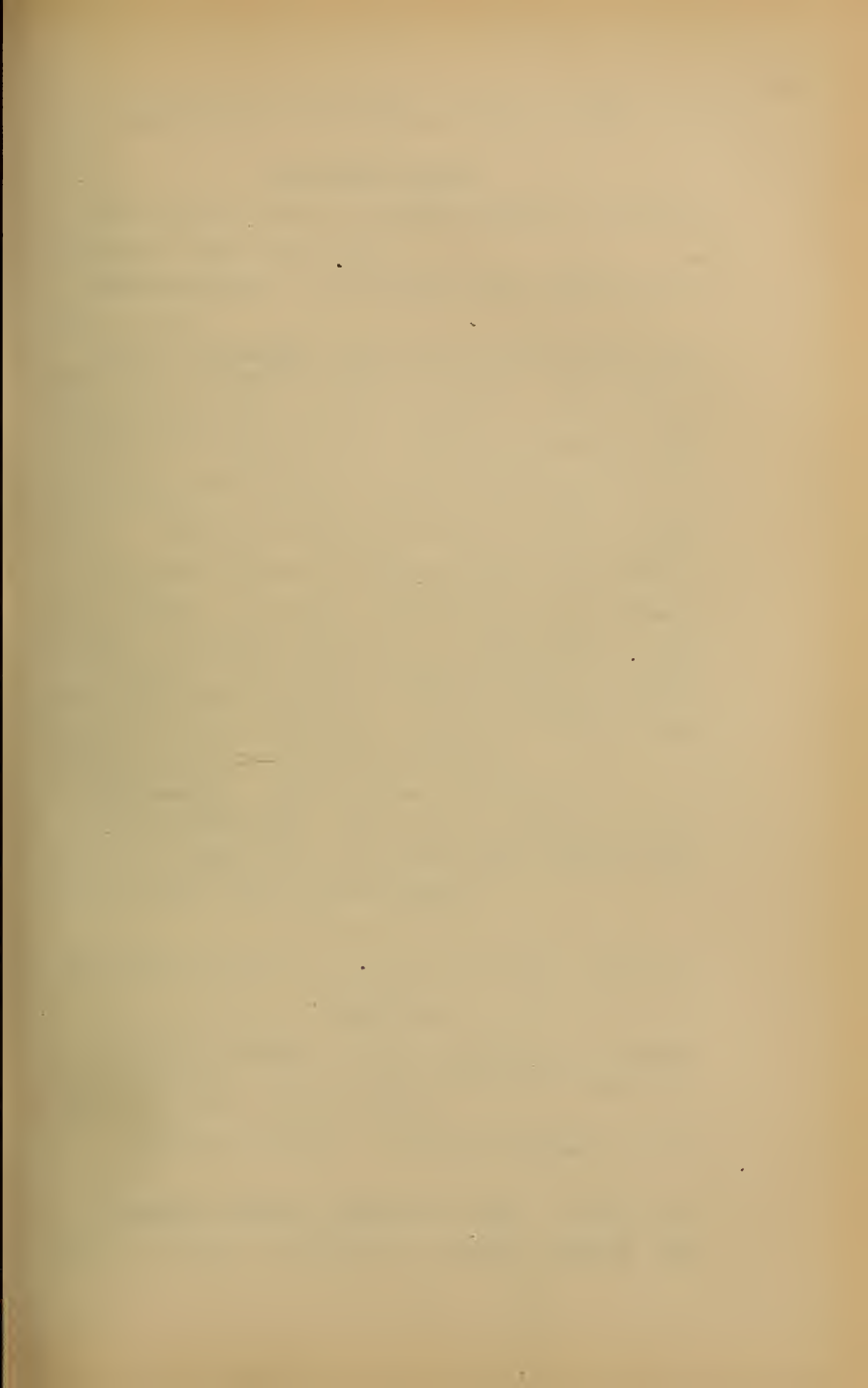
**Treatment of Poisoning.** Draw tongue forward, lower the head, bandage the limbs, compress the abdomen, external heat, strychnine, brandy, ether, faradization, artificial respiration, strong coffee by the rectum, forcible dilatation of the rectum, compression of the testicle, but never give amyl nitrite.

**After Effects.** Nausea, vomiting, though not so great as from ether; nephritis sometimes.

**Action compared with that of Ether.** More depressant to the vital functions, less irritating to mucous membranes, non-inflammable, more agreeable, more rapid, more profound narcosis, less vomiting, less excitant; must be well diluted with air. Chloroform mortality, one in 3,000; ether mortality, one in 6,000. Chloroform is to be preferred in hot countries, in multi-anesthesia, in conditions which contraindicate ether, in brain surgery and operations on the mouth, in obstetrics, and with children. The danger from chloroform is due more to the methods of administration than to the properties of drug itself.

**Therapeutics.** Neuralgia, rheumatism (1); colic (2); surgical examinations and operations, obstetrics (3); irritative cough (3, 7); bronchitis (1).

**Contra Indications.** Fatty heart, valvular heart disease.





**NITROUS OXIDE.**

The drug is a safe, but fleeting anesthetic, devoid of irritating effects, when pure.

**Administration.** By inhalation from a tube, air being excluded.

**General Anesthesia.** The face is at first flushed, and then grows pale, and the jaw drops. The pulse is strong and quick, and the arterial tension is raised, followed later by a fall. Respiration shallow and frequent. Anesthesia is produced partially by the lessened supply of oxygen and by direct effect on the brain. Anesthesia is prompt, being produced usually in about one minute, and lasting about from three to four minutes. Its use is attended by no after effects except occasional giddiness. If depression occurs, withdrawal of the drug and administration of oxygen will relieve the condition. There is some tendency towards motor stimulation, which in children and anemic persons may cause jactitation.

**Therapeutics.** Minor surgery and dentistry.

**Contra Indications.** Old age, or atheroma, on account of sudden rise in arterial tension, idiosyncrasy, large tonsils, lung or heart disease.

## DEPRESSANTS OF CIRCULATORY SYSTEM.

**ACONITE.**

1. **External Action.** At first stimulant to sensory nerve terminals, causing tingling, then depressant producing anesthesia and numbness.

*Antagonists*—Irritants. *Synergists*—Belladonna, cocaine, etc.

2. **Internal Action.—Digestive Tract.** At first irritant to mucous membranes, causing tingling, and

increasing secretion. Anesthetic. No other effect on the stomach unless the dose is large, when vomiting may result.

*Antagonists*—Cerium oxalate, bismuth, etc. *Synergists*—Irritants.

3. **Nervous System.** No effect on the intellectual centers of the brain. It is depressant to peripheral sensory nerves, then to sensory side of the cord, reflexes diminished. Large doses paralyze motor centers in the cord and motor nerve terminals.

*Antagonists*—Strychnine, caffeine, belladonna, etc. *Synergists*—Opium, bromide, acetanilid, etc.

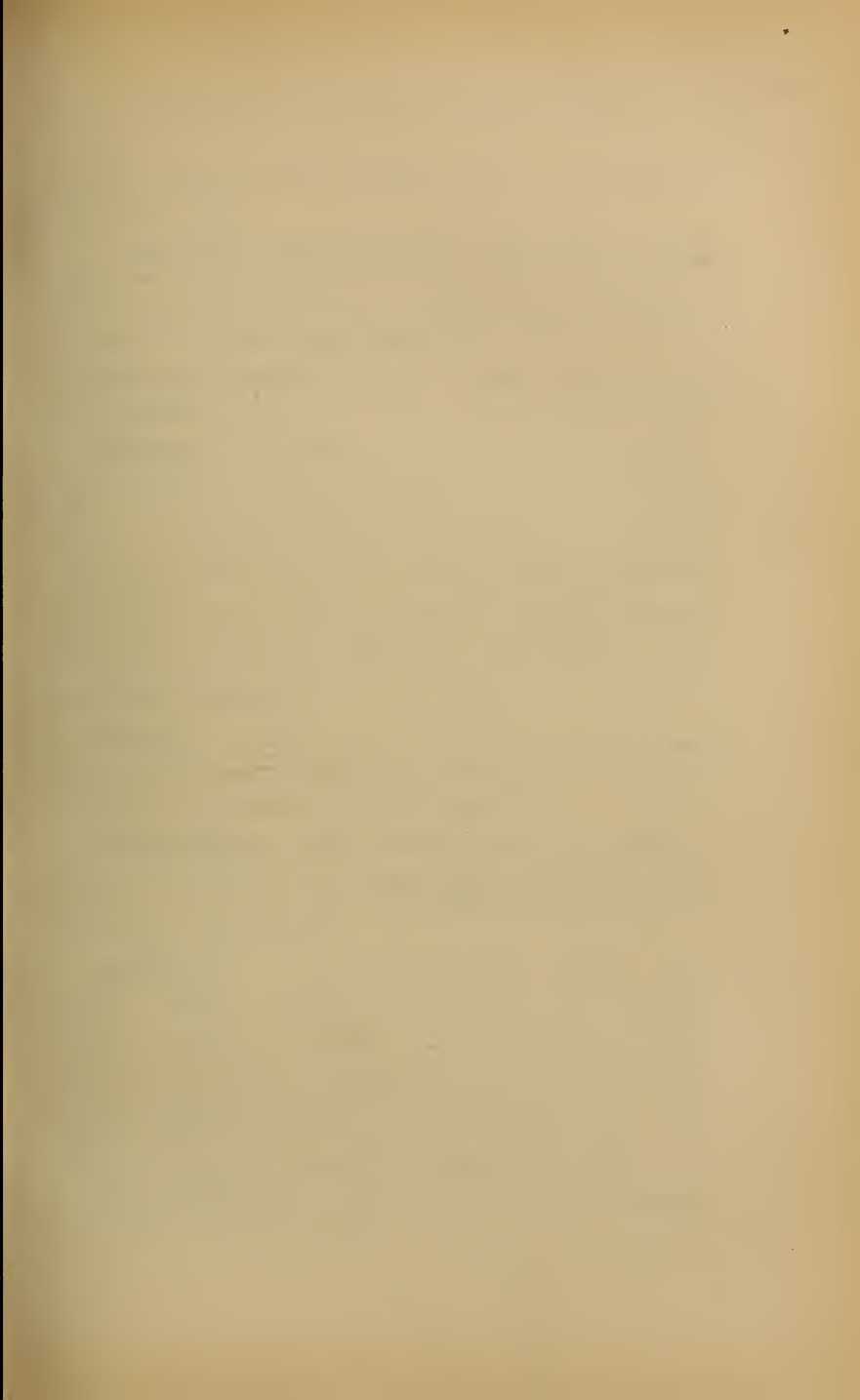
4. **Circulation.** The chief effect of moderate doses is a slowing of the heart, due to stimulation of the inhibitory centers. Larger doses cause depression of the muscle fiber, hence weak and irregular heart action, and also of the peripheral ends of the vagus. The heart is arrested in diastole. Arterial tension. This is lessened by decreased cardiac action, and it is further depressed by reflex dilatation of blood vessels, due to the primary stimulation of the afferent nerves in the skin. Moderate doses produce stimulation of the vasomotor center, but large doses depress the center.

*Antagonists*—Digitalis, ergot, belladonna, strychnine, alcohol. *Synergists*—Veratrum, antimony.

5. **Respiration.** Quieted, if breathing is hurried. Large doses depress the afferent nerve terminals in the lungs and the respiratory center; also weakens muscles of respiration, and causes venous congestion by interference with the circulation.

*Antagonists*—Belladonna, strychnine. *Synergists*—Antimony, hydrocyanic acid, etc.

6. **Temperature.** Is lowered, by diminished metabolism, through retarded circulation, and by dilatation







of the cutaneous blood vessels, and by depression of muscular tissue.

**7. Absorption and Elimination.** The drug is quickly absorbed, and its effects last from three to four hours. It is probably eliminated by the skin and the kidneys, acting as a diuretic and diaphoretic.

**Untoward Action.** Intense itching, vesicular and even pustular eruptions, vertigo, diminution of vision.

**Poisoning.** Symptoms. Tingling and burning sensation of the mucous membranes, beginning with the lips, vomiting, numbness, pulse weak and slow, then rapid and trickling, sweating, slow and shallow respiration, face pallid and anxious, exophthalmus, anesthesia of the skin, pupils variable, unusually dilated, temperature low, sometimes epileptiform convulsions, consciousness preserved. Death by gradual or sudden respiratory paralysis.

**Treatment.** Head lower than the heels, external heat, emetics or stomach pump, ether, alcohol, digitalis, atropine, strychnine, artificial respiration.

**Administration.** The tincture is the best preparation. Very minute doses frequently repeated (say one-tenth to one-half a minim every fifteen minutes to one hour) give good results.

**Therapeutics.** Neuralgia, neuritis, herpes, chilblains, pruritus, chronic rheumatism (1); sthenic fevers, tonsillitis, laryngitis, etc., bronchitis, the first stage of pneumonia and pleurisy (4, 6); pericarditis, nervous palpitation, excessive hypertrophy (4); colds (4, 7); cerebro-spinal meningitis, aneurism (4); vomiting of pregnancy, migraine, hyperesthesia (3).

**Contra Indications.** Sub-acute and chronic diseases, weak heart, gastric catarrh

**VERATUM VIRIDE.**

This is a safer drug than aconite, and its action resembles that of aconite, except in the following particulars:

**External Action.** It is more irritant to the skin.

**Internal Action.—Digestive Tract.** It is more irritant to mucous membranes.

**Circulation.** It is more depressant.

**Nervous System.** It has little or no effect on the sensory nerves, but depresses striated muscle, and finally paralyzes the motor tracts.

**Respiration.** It is less depressant.

**Absorption and Elimination.** It is quickly absorbed, and is eliminated by the bowels. It is less diuretic than aconite, and also less diaphoretic.

**Poisoning.** Symptoms. Causes no anesthesia of the skin.

**Therapeutics.** Not used externally. Internally, like aconite.

**AMYL NITRITE.**

1. **External Action.** None of consequence.

2. **Internal Action.—Circulation.** The drug produces great vascular dilatation by depression or paralysis of the muscular coat of the blood vessels. The heart acts tumultuously through relaxed inhibition and lessened resistance in the blood-vessels. Hemoglobin is changed to methemoglobin.

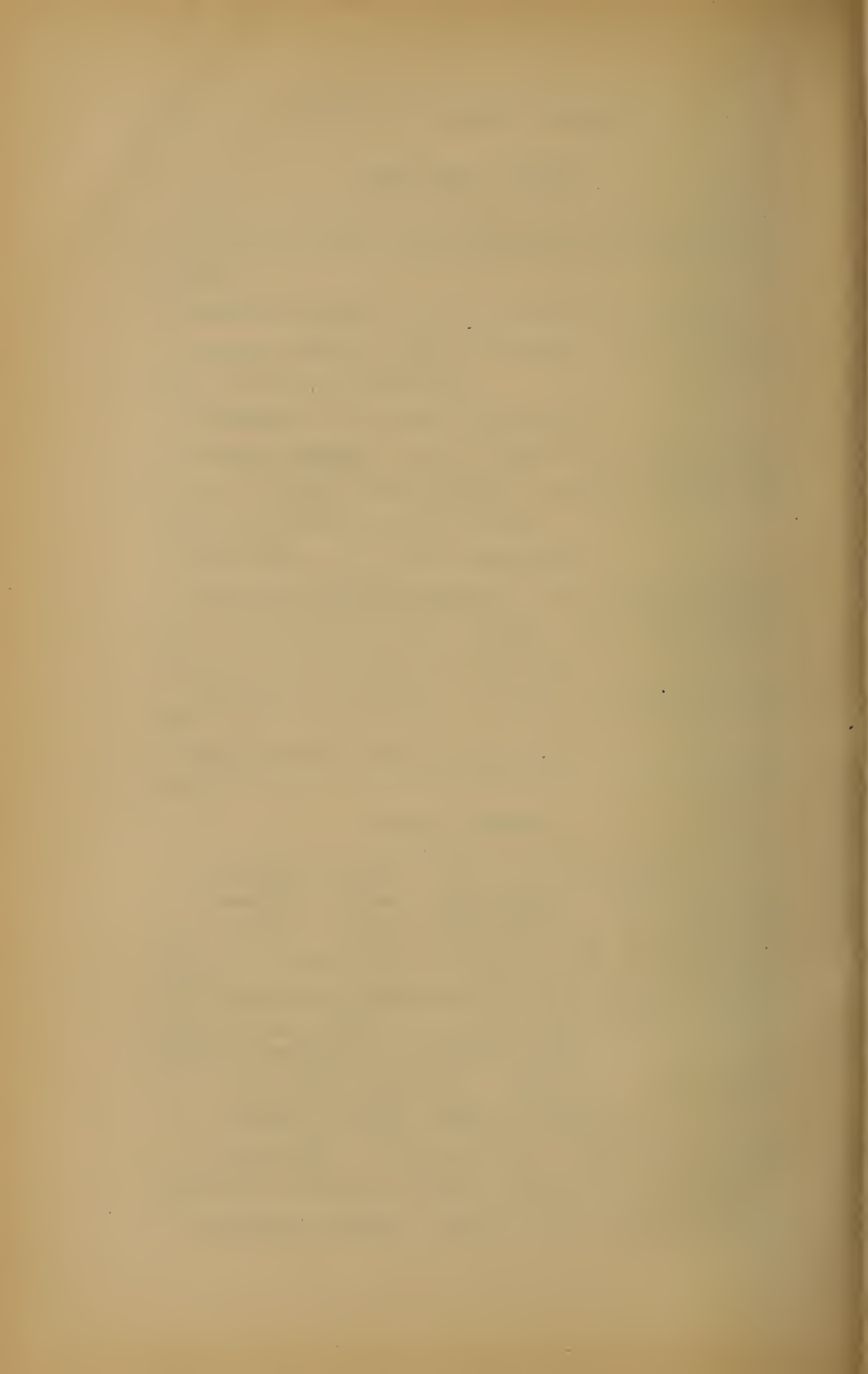
*Antagonists*—Belladonna, strychnine, ergot, digitalis.

*Synergists*—Aconite, veratrum, chloroform.

3. **Respiration.** Quickened by depression of the respiratory muscles and the condition of the blood.

4. **Nervous System.** Reflexes and motility are les-





sened by depression of the motor areas of the brain and cord. Sensation is diminished.

*Antagonists*—Strychnine, caffeine, coca. *Synergists*—Chloral, bromides, opium.

5. **Temperature.** Lowered by reason of the dilatation of cutaneous vessels and diminished oxygen-carrying power of the red blood corpuscles.

6. **Eye.** Dilatation of the retinal blood vessels, causing color and visual hallucinations.

7. **Absorption and Elimination.** It is very rapidly absorbed, more so by inhalation than when administered by the mouth; the effects are correspondingly transitory. Elimination by the kidneys is very rapid, increasing urine, uric acid and urea, and occasionally causing the appearance of sugar.

**Untoward Action.** Pharyngeal and gastric irritation, dryness of mouth, subjective sensations of color (usually yellow), flushed face, sensation of heat, throbbing in head, frontal headache.

**Poisoning.** Symptoms. Rapid, weak heart, cyanosis, slow and shallow respiration, cold extremities, subnormal temperature, abolished reflexes. Frontal headache is very intense. Death from cardiac or respiratory failure.

**Treatment.** Strychnine, digitalis, ergot, atropine, diffusible stimulants, artificial respiration.

**Administration.** Given usually only in emergency. Administered by inhalation until flushing in the face occurs; to be repeated according to indications.

**Therapeutics.** Angina pectoris (2); epilepsy, asthma, cardiac dyspnea, puerperal eclampsia, tetanus, strychnine poisoning, hiccough (4); congestive chill, chronic nephritis, chronic dysmenorrhea, enlarged heart, arterio-sclerosis (2).

**Contra Indications.** Conditions of physical debility.

**NITROGLYCERIN.**

The action of this drug is in every respect similar to that of amyl nitrite, except that its effects are produced more slowly and are more lasting, and that it causes more severe frontal headache.

**Administration.** Hypodermically or by the mouth every three to six hours.

**SODIUM NITRITE.**

Similar to nitroglycerin, except that its action is more slowly attained and of longer duration.

**Administration.** Every four to six hours by mouth.

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**DEPRESSANTS OF RESPIRATORY SYSTEM.****HYDROCYANIC ACID.**

*Incompatibles*—Cobalt nitrate, metallic salts.

This is perhaps the most rapidly acting poison known.

1. **External Action.** Applied to the skin, it paralyzes the end organs of the sensory nerves.

*Antagonists*—Irritants. *Synergists*—Aconite, belladonna.

2. **Internal Action.** Locally, in the stomach it produces depression of the sensory nerve terminals.

*Antagonists*—Irritants. *Synergists*—Aconite, cocaine, carbolic acid, etc.

3. **Respiration.** Respiratory action is depressed by medicinal doses. Nerve terminals in the lungs are depressed.

*Antagonists*—Belladonna, strychnine, caffeine, ammonia, camphor. *Synergists*—Aconite, bromides, opium, etc.

4. **Circulation.** At first the heart is slowed by stimulation of the pneumogastric nerve, and arterial tension







is raised by stimulation of the vasomotor center. This is soon followed by depression.

*Antagonists*—Strychnine, ammonia, ether, etc. *Synergists*—Aconite, nitrites, etc.

**5. Nervous System.** Medullary centers, peripheral afferent nerves, cord, motor nerves, and muscles are depressed; convulsions which occur are due to cerebral circulatory changes. Death is caused by paralysis of the respiratory or cardiac centers.

*Antagonists*—Strychnine, caffeine, cocaine. *Synergists*—Chloral, bromides, chloroform, etc.

**6. Absorption and Elimination.** The drug is rapidly absorbed and very rapidly eliminated by all avenues, or changed in the body (absorption may take place through broken skin).

**Untoward Action.** Salivation, irritation of the throat, headache, palpitation, staggering gait, drowsiness.

**Poisoning.** May be sudden or gradual. When sudden, the patient falls and expires with a gasp or convulsive movement. If gradual, the symptoms are burning in the throat, nausea and vomiting, dyspnea, slow, full pulse, giddiness, muscular weakness, dilated pupils, muscular spasm, incontinence of urine and feces.

**Treatment.** Ammonia, ammonium carbonate, whiskey and other cardiac stimulants, atropine, strychnine, cobalt nitrate, alternate hot and cold spinal douches and artificial respiration.

**Administration.** Only the diluted acid is used, a whiff of the strong acid being sufficient to produce death. Because of the fleeting action of the drug, it must be administered at short intervals to maintain its effect, say every half hour to every two hours.

**Therapeutics.** Gastralgia, vomiting (2); pruritus, certain skin diseases (1); irritable cough, asthma, whooping-cough (3).

**Contra Indications.** Conditions of extreme debility.

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## RESTORATIVES.

### THE GLYCERO-PHOSPHATES.

These preparations nearly approach the form in which phosphorus naturally occurs in the nervous tissues. They sometimes mildly stimulate the nervous system, but usually their effects are slowly produced. Their principle action is that of a nerve tonic or food, and from this action proceeds its beneficent effect in the different conditions in which they are used.

**Administration.** Sodium glycono-phosphate in solution. Calcium, lithium and iron salts in capsules.

**Therapeutics.** Neurasthenia, hysteria, nervous dyspepsia, chronic alcoholism, and any condition in which lack of nerve nutrition is present.

### MINERAL ACIDS.

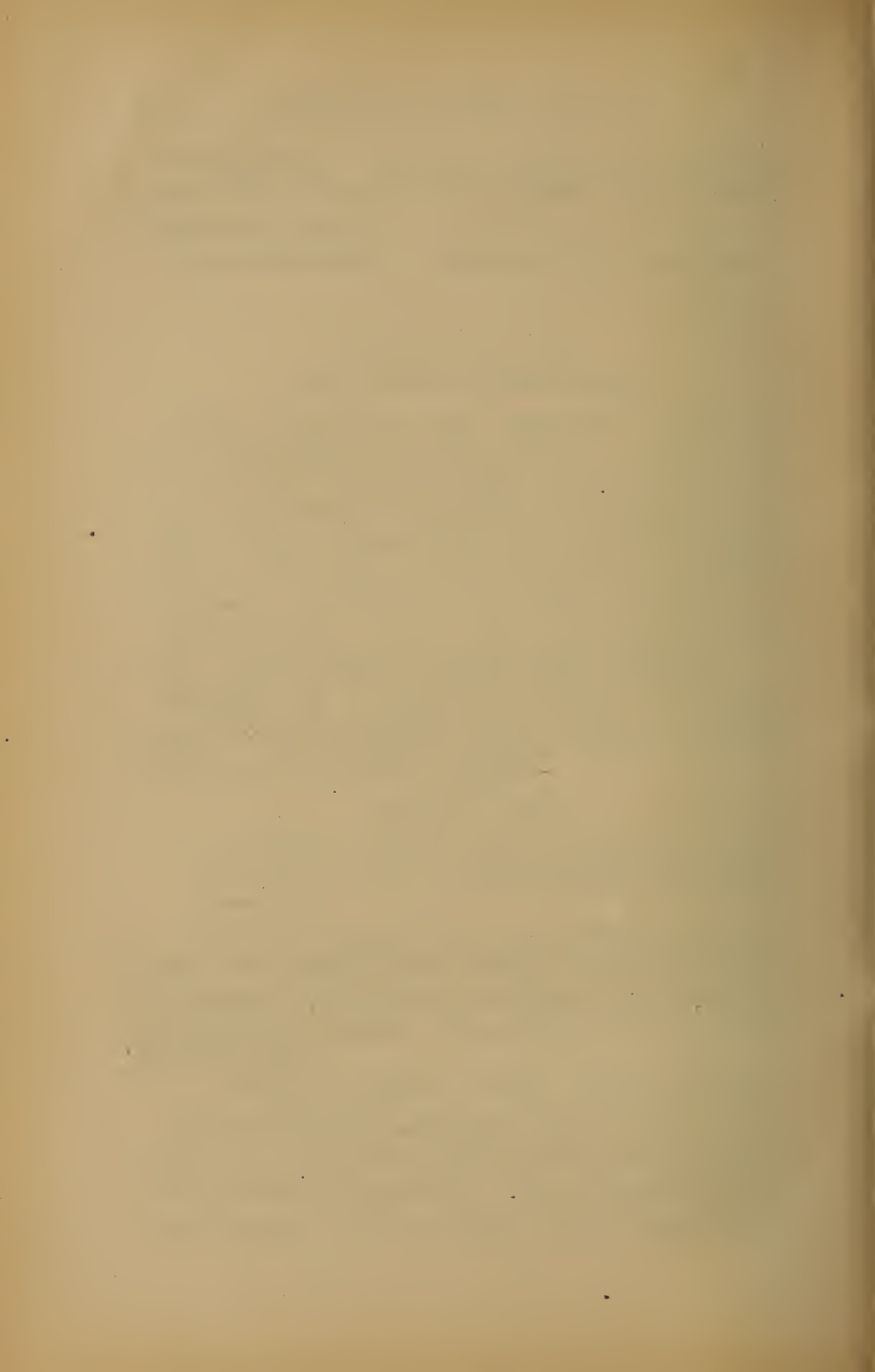
*Incompatibles*—Alkalies and their carbonates, salts of lime, lead and silver, oxidizable substances with hydrochloric acid.

1. **External Action.** The strong acids are escharotic, abstracting water from the tissues, and combining with the albumin of the body, destroying the protoplasm, and forming an eschar. Very dilute, they are irritant and astringent.

*Antagonists*—Alkalies, emollients. *Synergists*—Irritants.

2. **Internal Action.—Digestive Tract.** In the mouth they have an acid taste, and by their astringency produce a feeling of roughness. They stimulate the salivary secretion. In the stomach they are supposed to





lessen secretion, and to act as antiseptics, checking fermentation. In the intestines they tend to constipate by their astringency. Digestive processes are thus improved, but if too long continued digestion is interfered with.

*Antagonists*—Alkalies, opium. *Synergists*—Digestants, strychnine, astringents.

3. **Circulation.** The alkalinity of the blood is lessened, and if long continued, the quality of the blood deteriorates. Heart action is quickened, and arterial tension is moderately raised through nervous stimulation. Concentrated acids relax the heart muscle and blood vessels.

4. **Nervous System.** They stimulate the brain slightly.

5. **Absorption and Elimination.** They are rapidly absorbed. In the intestines they are converted into neutral salts, and so absorbed; entering the blood, they combine with the alkaline bases. They are rapidly eliminated by the kidneys as acid salts, rendering the urine more acid.

**Untoward Action.** Too long continued, tender mouth, salivation, pain, diarrhea, anemia, loss of flesh.

**Poisoning.** These drugs are corrosive poisons, destroying the mucous membranes of the mouth and stomach. Symptoms. Burning pain, strong acid taste, swollen tongue, discolored lips, vomiting (blood), purging, temperature may be elevated at first, collapse. Death by shock or exhaustion. If death does not occur soon, fatty degeneration of the vital organs develops.

**Treatment.** Demulcent drinks, soap or flour and water, egg albumin, milk, oil, carbonates cautiously, stomach pump cautiously, opium, stimulants.

**Administration.** Except nitrohydrochloric acid, only the diluted acids should be given internally. They

should all be well diluted when given, and should be given through a tube to protect the teeth, followed by an alkaline mouth-wash. Administer after meals.

**Hydrochloric Acid.** This is the least powerful acid, producing a tan schar, and is diffusible by redissolving tissue.

**Sulphuric Acid.** This and nitric are the two strongest acids. It produces a black eschar, and is diffusible.

**Nitric Acid** is one of the strongest acids, but is limited in its caustic action. It is not diffusible. If it is too long continued, it may produce salivation.

**Nitrohydrochloric Acid.** This is a powerful acid, even dissolving gold and platinum. The best effects are obtained by using the strong acid freshly prepared and well diluted at the time of administration. It has a special action as a liver stimulant by both internal and external use.

**Phosphoric Acid.** This acid is supposed to have special effect upon the nervous system.

**Therapeutics.—Hydrochloric Acid.** Noma, diphtheria, obstetrics, caries (1); gastric dyspepsia, intestinal indigestion, fevers, certain skin diseases (2).

**Sulphuric Acid.** Chancroid, cancer, bites of animals (1); serous diarrhea, cholera, lead poisoning, hematemesia, intestinal and uterine hemorrhage (2); sweating, scurvy, certain itching skin diseases (3).

**Nitric Acid.** Cancer, warts, gangrene, phagedenic ulceration, hemorrhoids, prolapse of the rectum, certain nose and throat diseases, moles, nerve and other skin diseases (1); intermittent fevers, serous diarrhea (2).

**Nitrohydrochloric Acid.** Hepatic disorders, syphilis, oxaluria, lithemia (3).

**Phosphoric Acid.** Tuberculous glands, scrofulous







ulcers (1), anemia, wasting diseases, neurasthenia, diabetes (3, 4).

**Contra Indications.** Acute inflammation of the stomach, rheumatism, gout, excessive acidity of urine.

#### VEGETABLE ACIDS. (*Acetic, Citric, Tartaric.*)

*Incompatibles*—Alkalies.

1. **External Action.** Irritant and, except glacial acetic acid, not caustic like mineral acids, acetic being the strongest and citric being the weakest.

2. **Internal Action.—Digestive Tract.** Similar to mineral acids. Intestinal glands are more stimulated than by mineral acids. The rest of the action is similar to that of mineral acids, but milder.

**Therapeutics.—Acetic Acid.** Obstetrics, gonorrhea, warts, corns, parasitic skin diseases, epistaxis (1).

**Citric Acid.** Urticaria, sweating (1); catarrhal jaundice, malaria, acute rheumatism (2).

**Tartaric Acid.** Diphtheria (1).

**Contra Indications.** As for mineral acids.

#### THE ALKALIES.

Liquor potassae, potassii acetas, potassii bicarbonas, potassii carbonas, potassii citras, potassii tartras, liquor sodae, sodii acetas, sodii bicarbonas, sodii carbonas, calcii carbonas precipitata, creta preparata, liquor calcis, lithii carbonas, lithii citras, magnesia, ammonii carbonas.

**Direct Antacids.** Lime water, prepared chalk and magnesia.

**Indirect Antacids.** Potassium acetate, tartrate, bi-tartrate, citrate, sodium acetate, lithium citrate.

**Both Direct and Indirect Antacids.** Liquor potassae,

liquor sodae, the carbonates and the bicarbonates of potassium, sodium, lithium, ammonium and magnesium.

*Incompatibles*—Acids, metallic salts.

1. **External Action.** Liquor potassae and liquor sodae are caustic, rubifacient, and soften and dissolve the epidermis, and also combine with albumin. Carbonates and bicarbonates are similar, but far less powerful in their action. Ammonium salts penetrate without dissolving the cuticle, cause effusion of lymph (vesicant), and if confined will cause suppuration and sloughing.

2. **Internal Action.—Digestive Tract.** Small doses of potassium increase the gastric flow when given before meals. Given after meals or in large doses, it neutralizes the gastric juice, and therefore interferes with gastric and intestinal digestion.

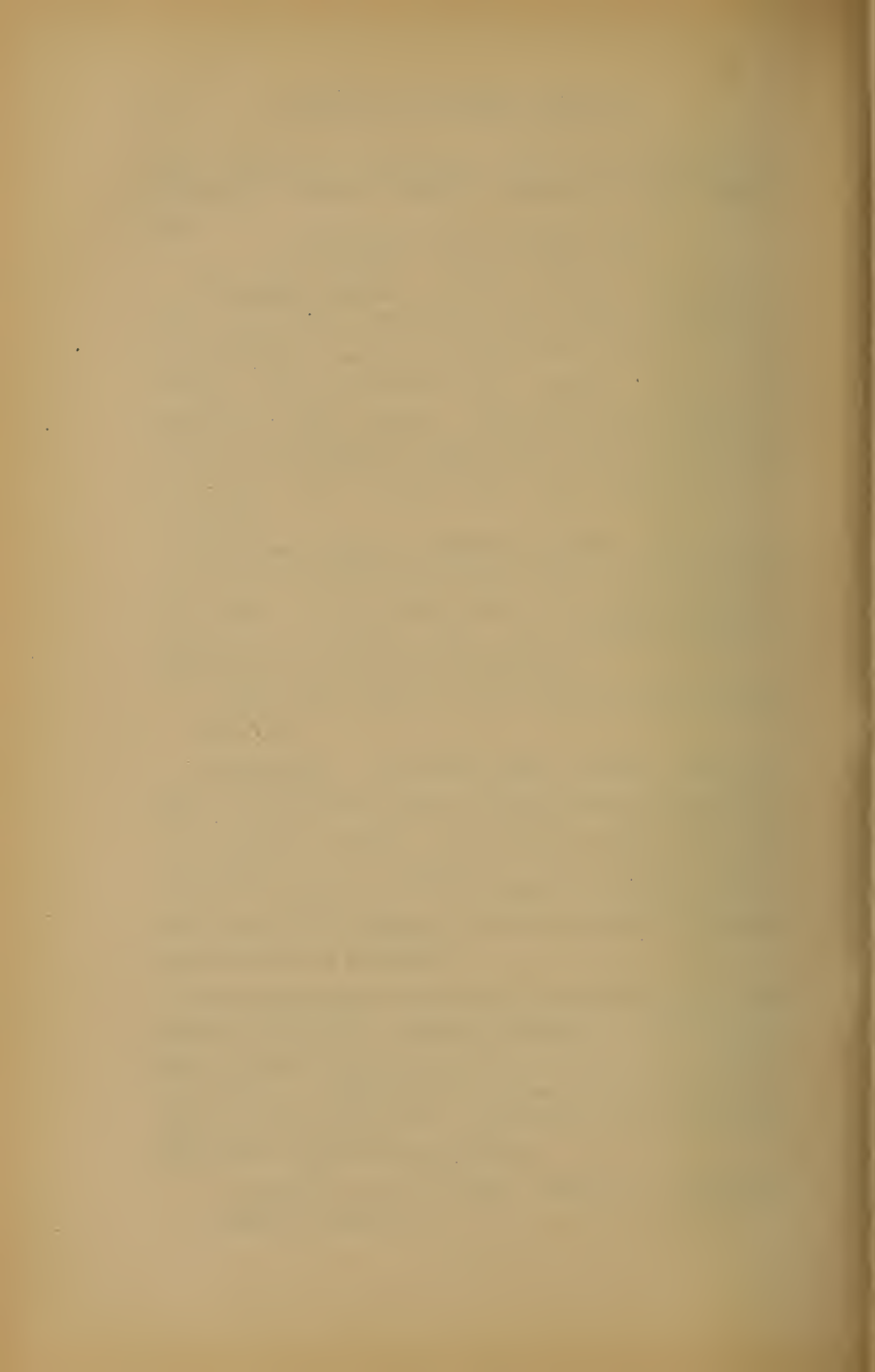
*Antagonists*—Belladonna, etc. *Synergists*—Bitters, strychnine, etc.

3. **Circulation.** Potassium salts increase the alkalinity of the blood, except the bicarbonate, when given on an empty stomach. Given after meals, these salts decompose in the stomach, and the alkaline base increases the alkalinity of the blood. Acetates, citrates and tartrates are changed in the blood into carbonates, and increase its alkalinity.

The hemoglobin is increased by potassium, but large amounts lessen its ozonizing function. Poisonous or long continued doses depress the heart muscle, weakening its force. Small doses increase the blood pressure; minute doses increase the contractile power of muscle; large doses depress and paralyze.

*Antagonists*—Acids, cardiac stimulants. *Synergists*—Mercury, iodine, etc.





4. **Nervous System.** Excessive doses paralyze nerve centers and motor nerves.

*Antagonists*—Strychnine, caffeine, etc.

5. **Respiration.** Bronchial secretions are increased in quantity, and are rendered more fluid.

*Antagonists*—Belladonna, opium, etc. *Synergists*—Expectorants.

6. **Absorption and Elimination.** They are quickly absorbed and eliminated. Salts of the vegetable acids are eliminated as carbonates, rendering the urine alkaline. Potassium salts are eliminated by the kidneys and bronchi, acting as diuretics and expectorants. Both the water and the solid matter of the urine are increased, urea is also increased, uric acid is diminished. The drug promotes waste.

**Untoward Action.** Impaired digestion, paralysis of the muscle fibers of the intestines, emaciation, anemia, nervous prostration, muscular weakness.

**Poisoning.** Caustic preparations are corrosive poisons.

**Treatment.** Vegetable acids, oils, demulcent drinks, stimulants, etc.

**Administration.** Give always well diluted, whether before or after meals depends upon the effects desired.

#### COMPARISON OF THE OTHER ALKALIES WITH POTASSIUM.

**Sodium Salts.** Are less depressant, less quickly absorbed, less diuretic, less solvent of uric acid.

**Calcium Salts.** They are direct antacids, and are more sedative and astringent to the digestive tract. They tend to constipate, have less effect on muscles and the reaction of the urine, and are less readily absorbed and eliminated. Avoid in oxaluria.

**Magnesium Salts.** They are direct antacids and gastric sedatives. Are also saline cathartics, and have less effect on the blood and heart, and are also less readily absorbed and eliminated.

**Ammonium Salts.** Are antacid and dilate the gastric vessels. See "Ammonium."

**Therapeutics.—Liquor Potassae.** Ingrowing toe nail, certain diseases of the skin, ear, and throat.

**Carbonates and Bicarbonates.** Certain diseases of the skin, burns, painful joints in acute rheumatism, certain diseases of the ear and throat (1); deficient gastric juice, hyperacidity of the stomach, atonic dyspepsia (2); gout, acute rheumatism, chronic rheumatism, rheumatoid arthritis (3).

**Prepared Chalk.** Certain diseases of the skin, burns, leucorrhea, vaginitis (1); diarrhea in children (2).

**Acetates, Bitartrates and Citrates.** They are used as diuretics, cathartics and diaphoretics, in lithemia, uric acid calculi, chronic and acute nephritis, cardiac dropsy (2, 6).

**Lime Water.** Acid stomach, vomiting, arsenical poisoning (2); diabetes insipidus, chronic bronchitis (6).

**Contra Indications.** Phosphatic diathesis, calcium in oxaluria.

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## ALTERATIVES.

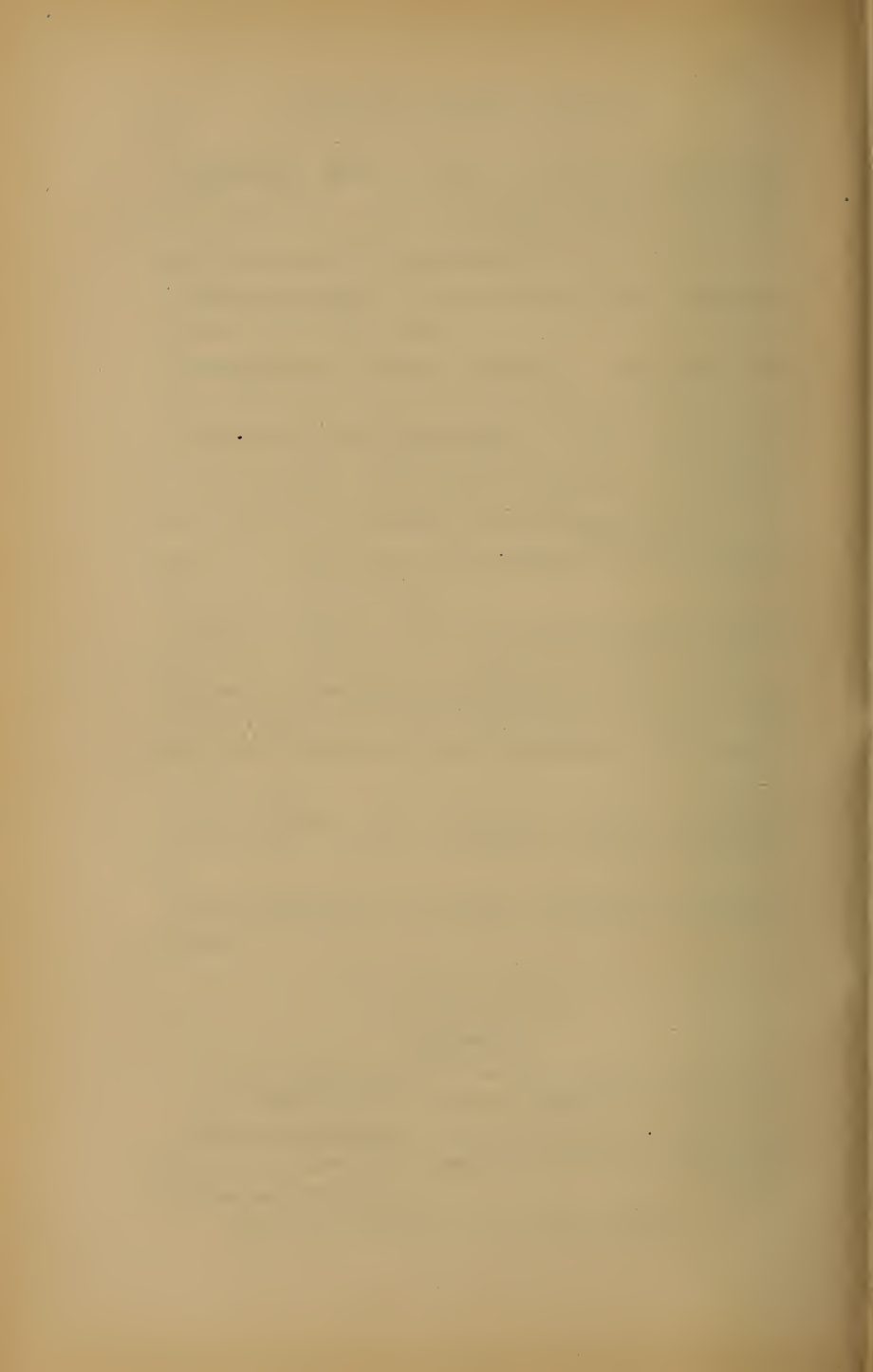
### ARSENUM.

*Incompatibles*—Salts of iron, silver, magnesia, lime, copper, ammonium and vegetable astringents.

**I. External Action.** On the skin it is caustic and escharotic, followed by sloughing. It may be absorbed from the broken skin.

*Antagonists*—Emollients. *Synergists*—Caustics.







2. **Internal Action.—Digestive Tract.** Irritant to mucous membranes. In the stomach small doses stimulate secretion and peristalsis. In large doses it is a violent irritant. The drug has similar action in the intestines.

*Antagonists*—Astringents, etc. *Synergists*—Bitters, etc.

3. **Nervous System.** Small doses are tonic to the brain and entire nervous system (antiperiodic), especially to trophic nerves, stimulating nutritive changes. Large doses depress first the sensory cord, diminishing reflexes (tingling, hyperesthesia, anesthesia), then follows depression of the motor cord and paralysis, especially of the extensors. The drug tends to accumulate in nerve tissue, and is often found in nerve centers.

4. **Circulation.** On the blood the drug acts as a hematic, small doses preventing destruction of red blood cells and aiding iron. Large doses decrease the red blood cells and lessen the coagulability of the blood. Small doses stimulate the heart, increasing the rate and force; large doses directly depress the muscle, ganglia and nerves, rendering the action irritable and feeble. Arterial tension is lowered by depression of the heart and vasomotor system. The larger vessels are especially relaxed.

5. **Respiration.** Small doses distinctly stimulate the respiratory center, and possibly the lung terminals of the vagus. Large doses depress.

6. **Metabolism.** Is decreased by small doses and increased by large doses. The drug is an alterative.

7. **Absorption and Elimination.** The drug is readily absorbed. It is eliminated by the kidneys (increasing the urine in small doses, decreasing it in toxic doses); skin (exfoliation and eruption); bowels (purging); saliva; milk (may effect nursing child); bronchi.

**Eye.** Large or continued doses may cause injection of the conjunctiva, inflammation and edema of the lids, and neuritis.

**Untoward Action.** Restlessness, headache, alopecia, bronchitis, coryza, thirst, digestive disturbances, puffy lids, cutaneous eruptions.

**Poisoning.—Acute.** Symptoms. Symptoms of acute gastro-enteritis with "rice water" stools with blood and shreds of mucous membrane. Often a remission about the third day, as in phosphorus poisoning. Thirst, albuminous urine, rash, multiple neuritis may occur. Death in from four to six days. Occasionally death may occur quickly after the injection of the poison with collapse. If the patient lives long, fatty degeneration of the organs will take place.

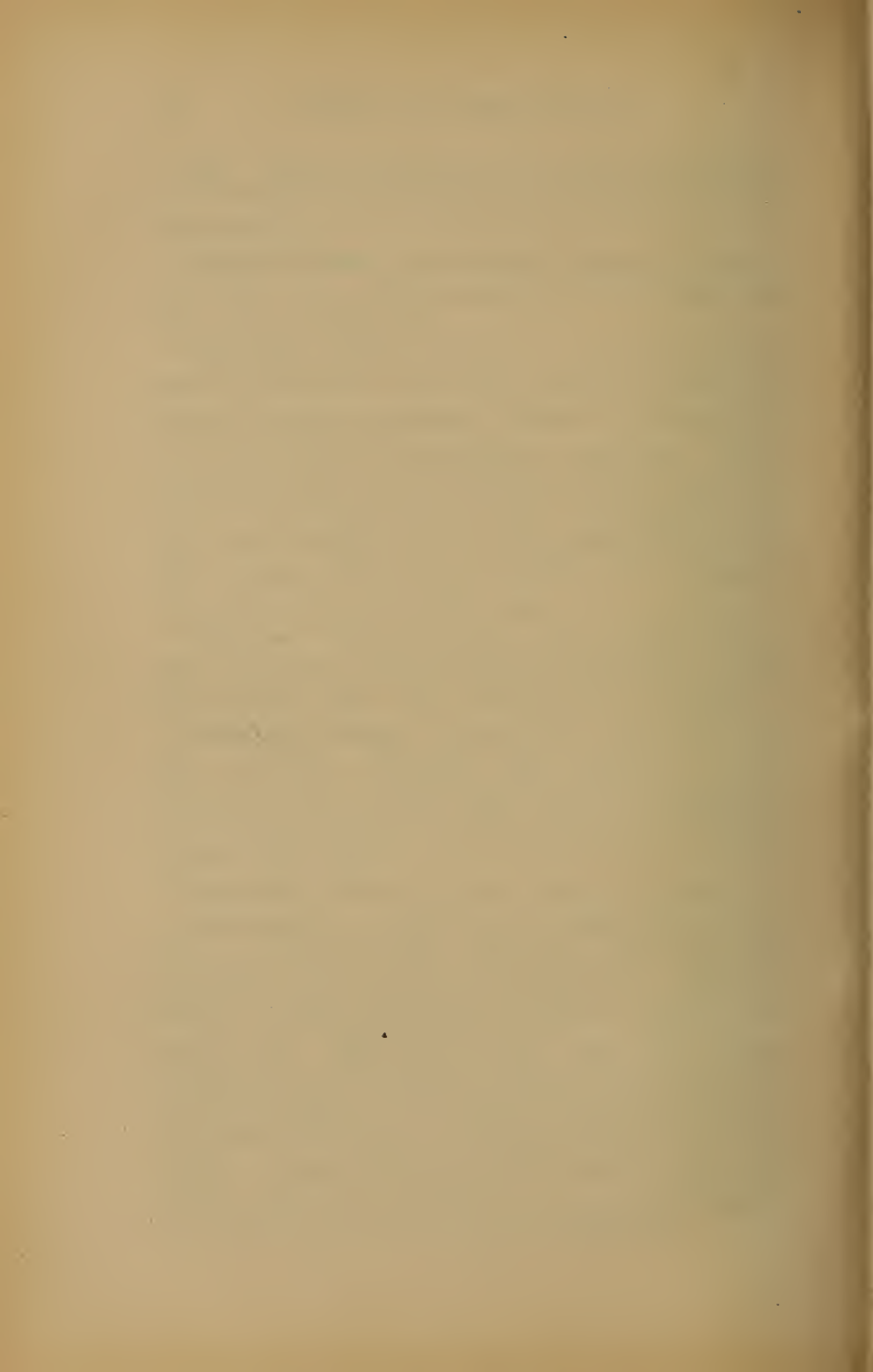
**Treatment.** Stomach pump, emetics, cardiac stimulants, demulcent drinks, hydrated sesquioxide of iron and magnesia, lime water, dialyzed iron, magnesia.

**Poisoning.—Chronic.** Symptoms. Headache, vomiting, diarrhea, abdominal pain, irritation of the respiratory tract, watery eyes, injected conjunctiva, herpes zoster, peripheral neuritis, paralysis of extensor muscles, depression.

**Treatment.** Potassium iodide, tonics, hygiene.

**Administration.** The drug is usually given three times a day after meals. Arsenous acid is the solid preparation most used, and solution of potassium arsenite (Fowler's Solution) the liquid. Children bear arsenic well. Begin with minute dose and increase gradually up to ten or fifteen minims, or until untoward symptoms appear. If the drug is administered hypodermically, it is less toxic than when given by the mouth. For this purpose sodium arsenite is best, as Fowler's solution is irritating, and may cause abscess. By careful use tolerance may be established.





**Therapeutics.** Superficial cancer, sarcoma, warts, corns (1); numerous chronic skin diseases, asthma, bronchitis (7); dysmenorrhea, pernicious anemia, leukemia, Hodgkin's disease (4); malaria, neuralgias, headache (3); phthisis, with excessive expectoration (3, 4, 6); chorea (3); gastralgia, gastritis, gastric ulcer, cancer, constipation (2); syphilis (6); hay fever, coryza (3, 7); melancholia, hypochondria (3, 4).

**Contra Indications.** Acute skin diseases, intestinal inflammation, acute phthisis, with tendency to hemorrhage.

#### HYDRARGYRUM.

*Incompatibles* are so general that this drug is best administered alone.

1. **External Action.** Metallic and mercurous preparations are absorbed. They do not combine with albumin. Metallic preparations are non-irritant. Mercurous preparations are stimulant or slightly irritant. Mercuric preparations are irritant, combine with albumin, and are not absorbed. All preparations of mercury are antiseptic and anti-parasitic. Mercuric preparations are most antiseptic.

2. **Internal Action.—Digestive Tract.** Mercury in the stomach forms a molecule of chlorine, sodium, mercury and albumin, which is partly absorbed here. Mercuric preparations, if concentrated, will cause gastro-enteritis. Mercurous preparations are not irritant to the stomach. In the intestines, mercury stimulates the secretions of the intestinal glands and of the pancreas, causes expulsion of the bile from the gall-bladder, and increases peristalsis, its action being chiefly on the duodenum and jejunum. In causing the outflow of the bile, it acts as an indirect cholagogue. The bichloride is supposed to stimulate the liver

directly. Mercury is absorbed in part only in the intestines, the rest passing out as the sulphide.

*Antagonists*—Opium, belladonna, astringents. *Synergists*—Cathartics, intestinal antiseptics.

3. **Blood.** The drug is readily absorbed, forming oxyalbuminate. In small doses it acts as a tonic to the blood, increasing the number of the red blood corpuscles. In large doses, or too long continued, it reduces the ozonizing function of the blood, and also lessens its coagulability by diminishing the fibrin factors. The blood becomes watery, and anemia is produced.

*Antagonists* (for large doses)—Hematics.

4. **Respiration, Circulation, Nervous System.** All are depressed by prolonged use.

5. **Special Action.** The drug is an alterative, producing change in the growth of cells. In small doses it is stimulant to the tissues, but large doses impair nutrition. All secretions are increased by mercury.

*Antagonists*—Opium, belladonna.

6. **Absorption and Elimination.** It is eliminated by all avenues, but nevertheless the drug accumulates rapidly in the tissues.

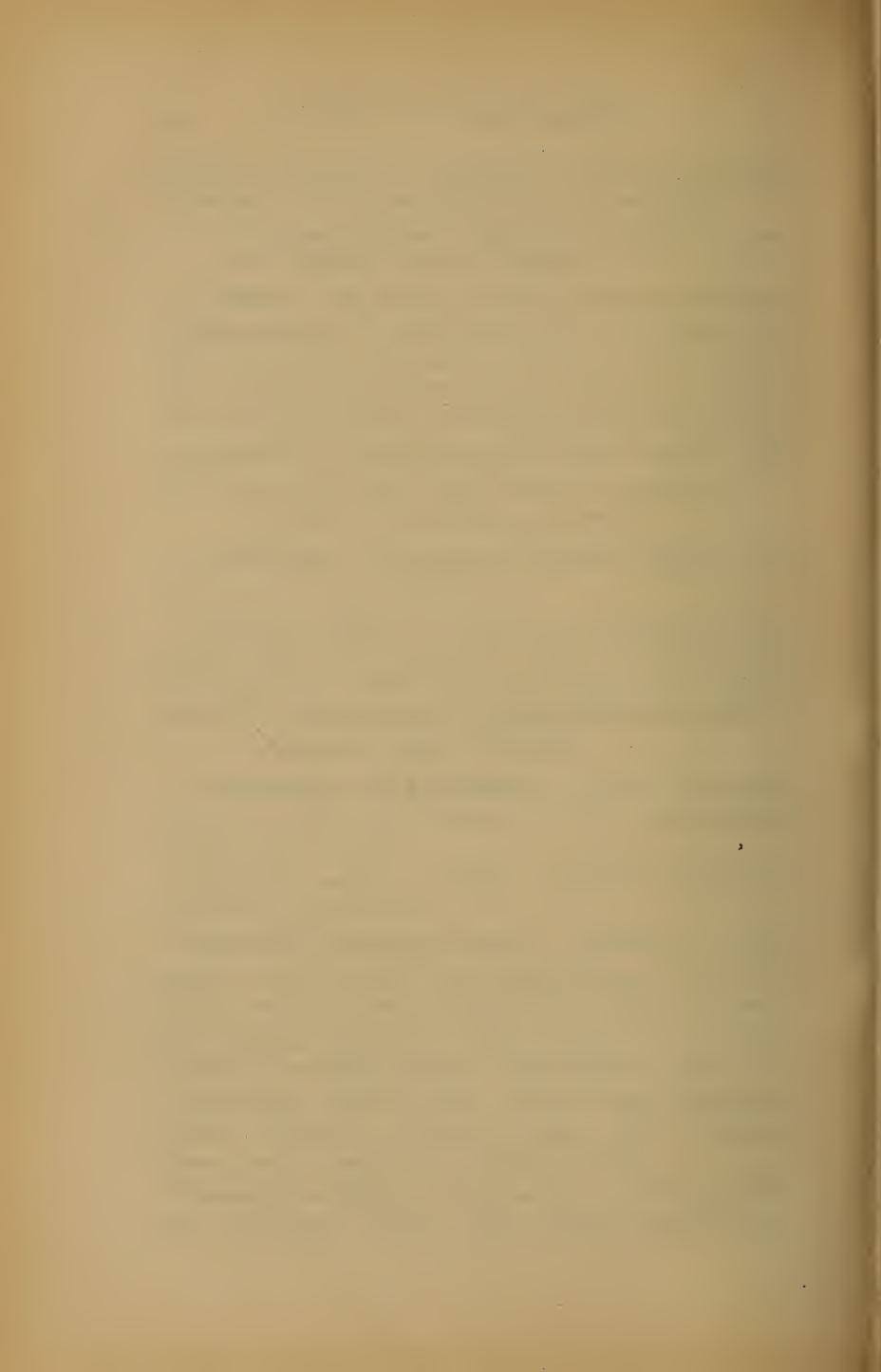
**Untoward Action.** Eczema, erythema, salivation, stomachic disturbances.

**Mercurial Poisoning.—Acute.** Symptoms. Fetid breath, swollen, tender and spongy gums, loose teeth, profuse salivary flow, metallic taste, anorexia, vomiting, purging, emaciation, pallor, cutaneous eruptions, headache, insomnia, tremor, convulsions, coma.

**Treatment.** Stomach tube, white of egg, demulcent drinks, potassium chlorate, tannic acid, atropine, opium, heart stimulants, nutritious food.

**Poisoning.—Chronic.** Symptoms. Cachexia, anemia, emaciation, leathery skin, anorexia, nausea, ten-







dency to diarrhea, pulse rapid on exertion, respiration labored, paralysis of groups of muscles, muscular weakness. Special senses are all diminished, mental weakness, irritability and depression, alopecia.

**Treatment.** Magnesium sulphate, remove cause, sulphur internally and in baths, potassium iodide, symptomatic.

**Administration.** Idiosyncrasy is common. Avoid if patient has been previously salivated. Use cautiously in depressed conditions. Externally use the ointment by inunction. The oleate is simply applied to the skin. Calomel locally or by fumigation. Inunction should be used on thoroughly cleaned surfaces, and where the skin is thin. Fumigation under blankets draped from the neck down. The drug may be given hypodermically deep into the gluteal muscles or subcutaneously into the back, the bichloride being generally used for this purpose. Internally, calomel, blue powder and the bichloride may be used for effects on the alimentary tract. All preparations may be used for systemic effects.

**Therapeutics.** Diseases of the skin, venereal ulcers, many diseases of the eye, ear and throat, sub-acute synovitis, syphilitic orchitis and epididymitis, skin parasites (1); syphilis (5); chronic dysentery and diarrhea of children, vomiting, hepatic congestion, cirrhosis, bilious attacks (2); non-suppurative inflammation, chronic interstitial nephritis, chronic endarteritis, etc. (5); sthenic acute inflammation, meningitis, pericarditis, acute bronchitis, early in pneumonia, endocarditis, diphtheria, membranous croup (3).

**Contra Indications.** Tuberculosis, strumous diathesis, chronic interstitial nephritis when it diminishes the urine, acute asthenic diarrhea and dysentery, previous salivation.

**IODUM.**

*Incompatibles* are general. The drug is best administered alone.

1. **External Action.** On the skin it is an antiseptic, irritant, and may cause vesication and desquamation. It stains the skin brown. The fumes irritate the respiratory tract when inhaled (sneezing, coryza, headache, etc.).

*Antagonists*—Emollients. *Synergists*—Irritants.

2. **Internal Action.** It has a disagreeable taste, causes lacrymation, and is readily absorbed by the mucous membrane, forming a loose combination with albumin. In the stomach small doses are stimulant, large doses are irritant, and may cause inflammation. It here forms sodium iodide and sodium iodate, and is so absorbed.

*Antagonists*—Bismuth, oils, etc.

3. **Alkaline Iodides** have no external action; they produce a metallic taste in the mouth, and are irritating to the stomach. Iodine and the iodides have no known influence on the blood except to lessen the solid constituents if long continued.

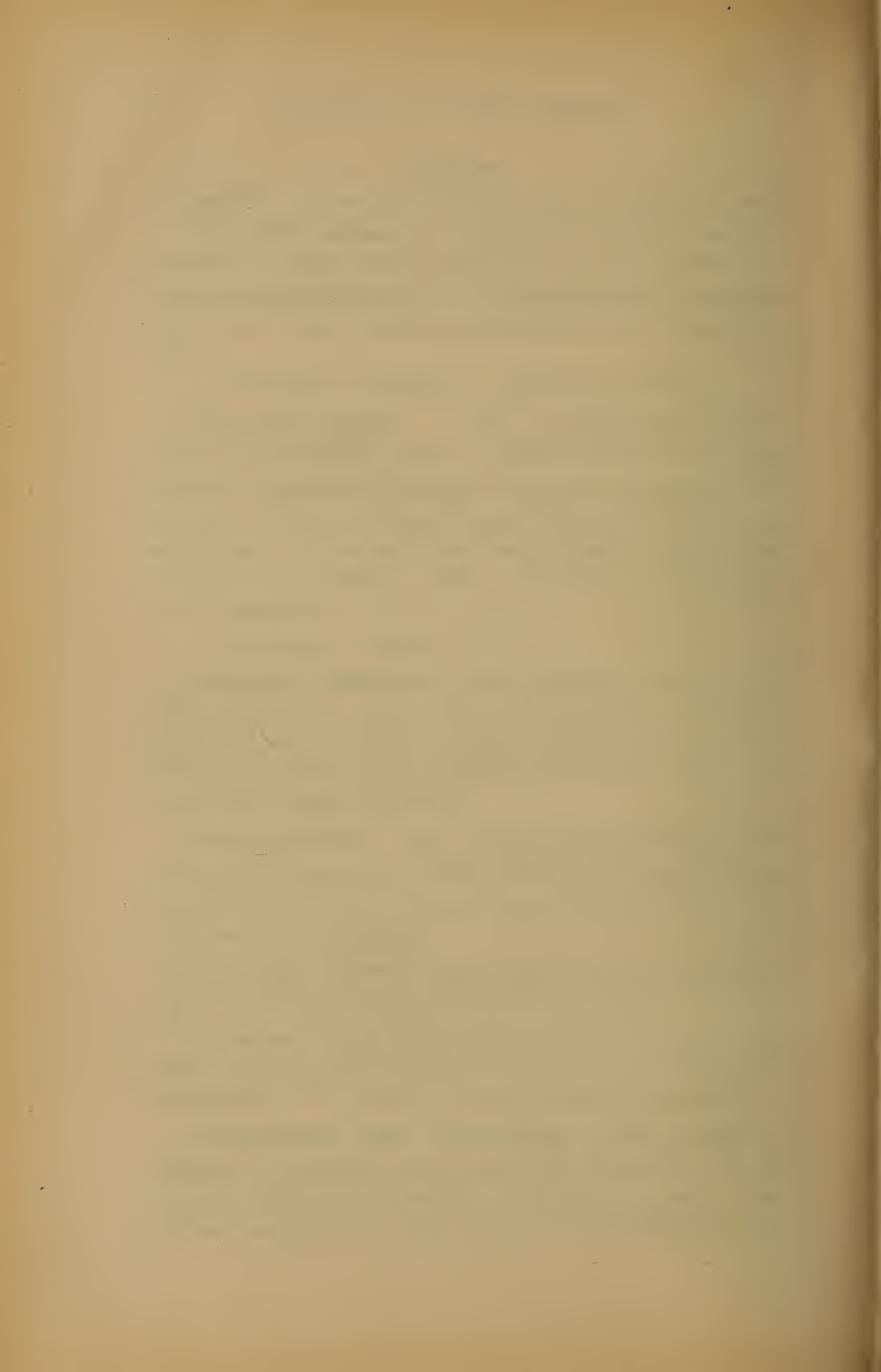
4. **Special Action.** They are general alteratives, dissolving the metals out of the tissues, altering nutrition, lessening the vitality of the newly formed tissues, and absorbing new growths.

5. **Nervous System, Respiration, and Circulation.** They are all depressed by poisonous doses.

6. **Uterus.** Small doses hasten menstrual flow; large doses depress. Continued use may cause atrophy of the ovaries. The drug is said to produce abortion.

7. **Absorption and Elimination.** The drug is promptly absorbed, and is rapidly eliminated by all avenues, kidneys (diuretic, nitrogenous waste increased, nephritis); salivary glands (salivation); skin





(eruptions, antiseptic and stimulating) ; lungs (stimulating and antiseptic).

**Untoward Action.** See "Iodism."

**Poisoning.—Acute.** Symptoms. Metallic taste, burning in the throat, gastro-enteritis, depression, rapid, weak pulse, convulsions, urine dark, scanty and albuminous or suppressed. Death by respiratory failure.

**Treatment.** Stomach pump, starch, sodium bicarbonate, stimulants, external heat.

**Poisoning.—Chronic. Iodism.** Symptoms. Frontal headache, lacrymation, salivation, expectoration, increased nasal secretions, acne, anemia, emaciation, muscular weakness, palor, dyspnea, numbness, loss of intellect, loss of sexual power, atrophy of the mammary glands and testicles.

**Administration.** As all are irritant, protect the stomach with milk. The sodium salt is less toxic than the potassium. The iodides are best given in small doses at first, gradually increasing to establish tolerance. Tincture of belladonna and sodium bicarbonate prevent coryza. Syrup of hydriodic acid is not apt to cause iodism.

**Therapeutics.** Chronic gout, pleurisy, synovitis, neuritis, periostitis, onychia, bubo, enlarged glands, hydrocele (hypodermically), anal fissure, chronic metritis and endometritis, various skin diseases, certain chronic splenic and hepatic diseases, acute coryza, catarrhal deafness, chronic pharyngitis, inflamed joints (1); syphilis, mercurial poisoning, scrofula (4); cirrhosis, tubercular meningitis, dropsy, muscular rheumatism, chronic interstitial nephritis, asthma (4, 5); vomiting of pregnancy (2).

**Contra Indications.** Tuberculosis, administration of quinine, iodism.

**COLCHIUM.**

*Incompatibles*—Tannic acid.

1. **External Action.** It is irritant and rubifacient to the skin. Inhaled it causes sneezing.

*Antagonists*—Emollients. *Synergists*—Irritants.

2. **Internal Action.—Digestive Tract.** Small doses increase the flow from all of the glands, especially the bile. Larger doses cause burning in the epigastrium, nausea and loss of appetite. Toxic doses produce gastro-enteritis.

*Antagonists*—Opium, belladonna, etc. *Synergists*—Mercury, podophyllin, etc.

3. **Circulation.** Small doses have no effect. Large doses cause weak, rapid pulse.

*Antagonists*—Alcohol, opium, etc. *Synergists*—Cardiac depressants, etc.

4. **Nervous System.** No effect in small doses. Large doses may cause numbness, muscular pain or convulsions. The intellect is unaffected.

5. **Respiration.** Is depressed by toxic doses.

6. **Special Action.** Alterative, especially in gouty diathesis.

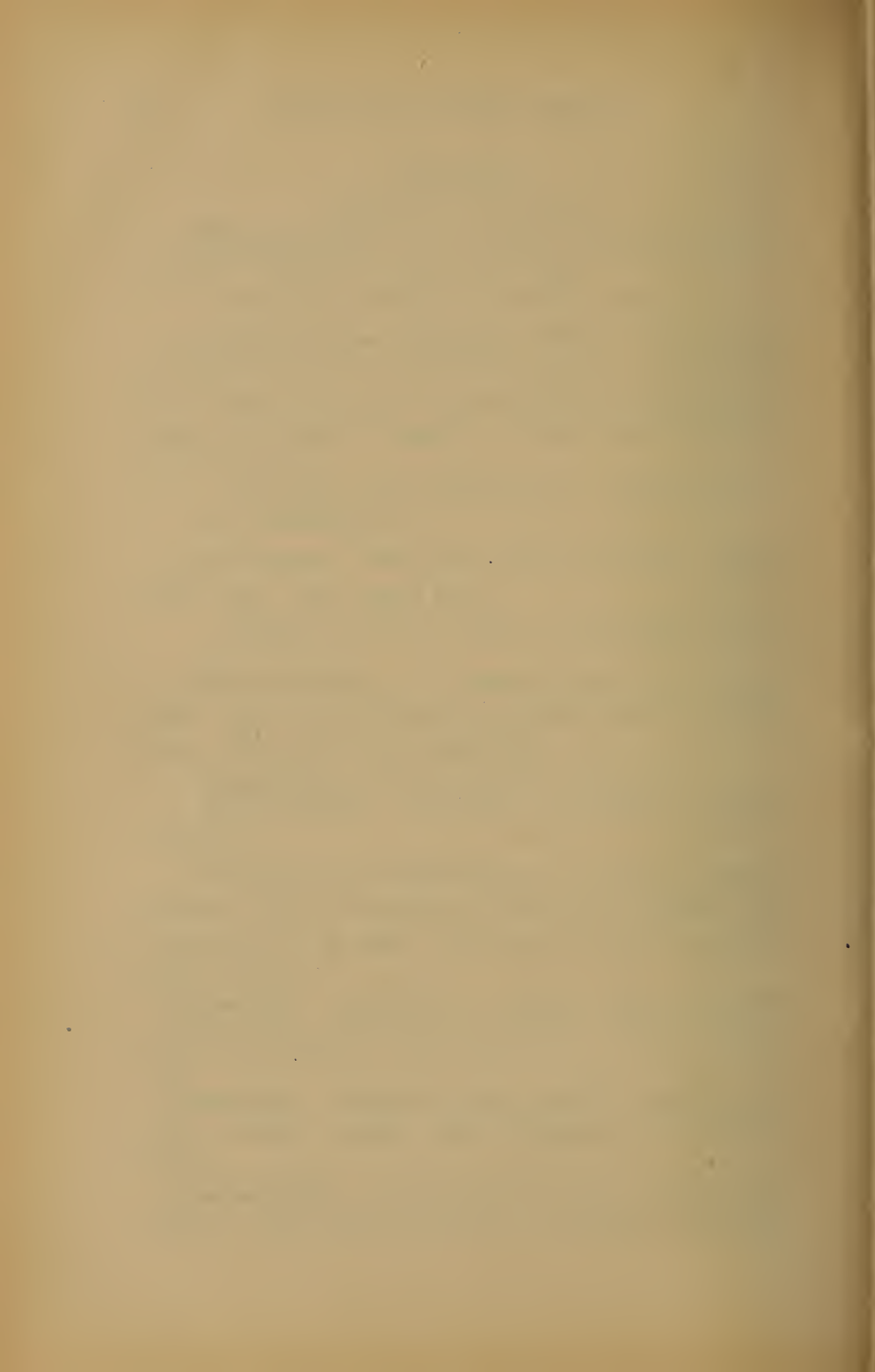
7. **Absorption and Elimination.** The drug is rapidly absorbed, and is eliminated by the bowels, kidneys and somewhat by the skin. Urea and uric acid are probably increased.

**Poisoning.** Symptoms. Intense gastro-enteritis with agonizing pain, and treatment is usually unavailing.

**Treatment.** Stomach pump, tannin, emetics and bland drinks, cardiac and respiratory stimulants, opium.

**Administration.** The strength of the crude drug varies. Use assayed tincture, and begin with small







dose three times a day after meals. When purging occurs, the dose should be lessened.

**Therapeutics.** Gout, diarrhea, dysentery, dyspepsia, bronchitis, asthma, neuralgia, eczema of gouty origin (6); ascites, cerebral and portal congestion(2).

**Contra Indications.** Acute inflammation of the gastro-intestinal tract, care in old age.

### PHOSPHORUS.

*Incompatibles*—Hydrated magnesia, lime water, charcoal, copper sulphate.

1. **External Action.** Applied to the skin it causes inflammation and sometimes gangrene. Inhalation of the fumes will cause inflammation of the respiratory tract and conjunctivae, and if the teeth are imperfect, may cause maxillary necrosis.

*Antagonists*—Emollients. *Synergists*—Irritants.

2. **Internal Action.** In the stomach in small doses it stimulates secretion and aids digestion. Large doses are violently irritant to the gastro-intestinal tract.

*Antagonists*—Astringents. *Synergists*—Bitters, etc.

3. **Circulation.** Small doses increase heart force. The facial capillaries are dilated, thus increasing the cutaneous circulation and causing diaphoresis.

4. **Nervous System.** Being a normal constituent of nerve tissue, phosphorus is a tonic and food to the brain and nerves. Similarly it stimulates the growth of bone.

5. **Respiration.** Is increased by the general nervous stimulation. Toxic doses depress the respiratory center.

6. **Metabolism.** Nitrogenous waste and carbon dioxide are diminished, and the glycogenic function of the liver is lessened.

7. **Temperature.** Is somewhat lowered by the increased radiation and evaporation.

8. **Absorption and Elimination.** It is partly converted into phosphates in the stomach and so absorbed, partly dissolved by the fats and absorbed as elementary phosphorus. It is eliminated chiefly by the urine, increasing the phosphates, and partly by the liver.

**Untoward Action.** Gastro-intestinal irritation, jaundice, retinal hemorrhage.

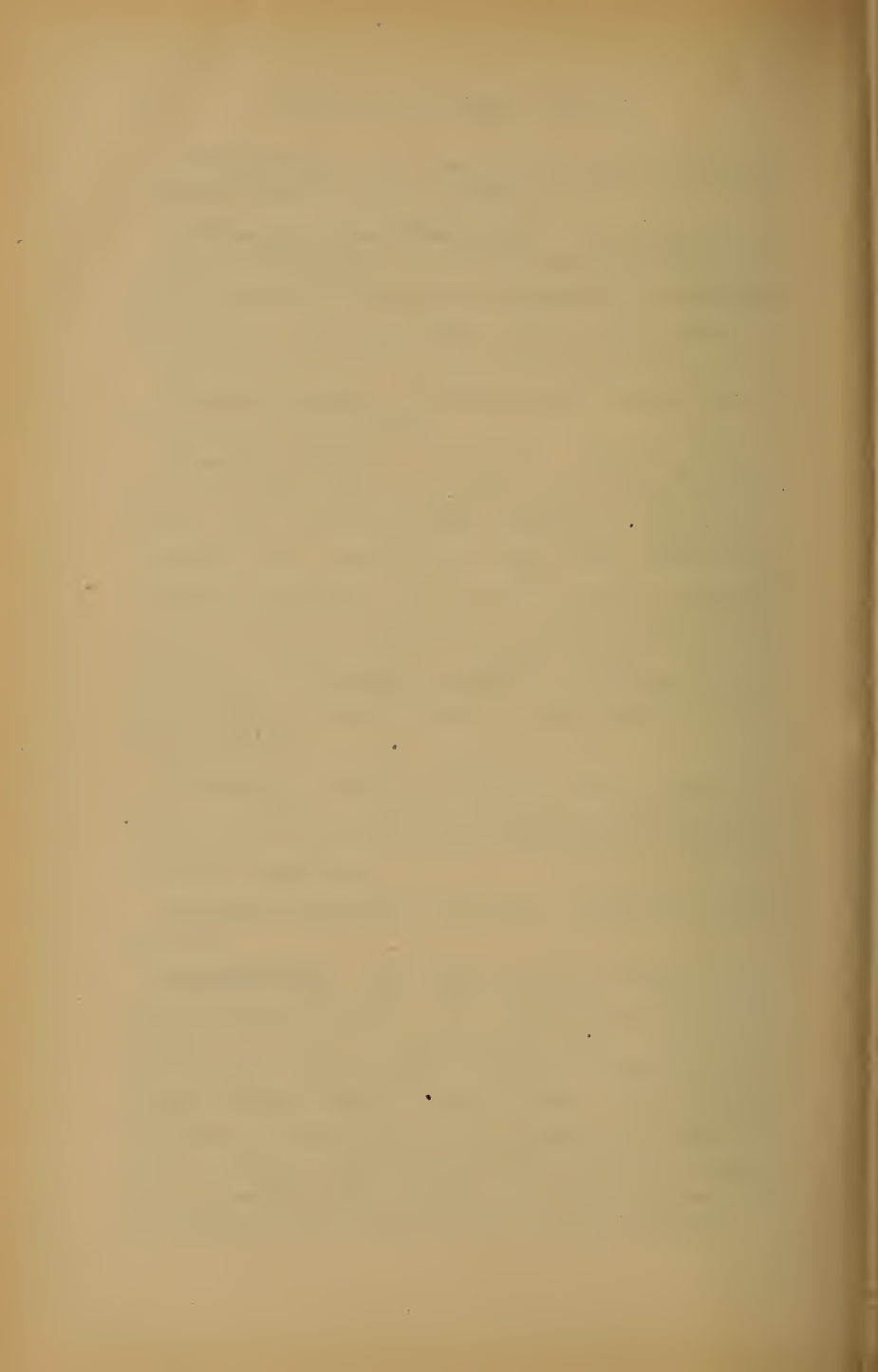
**Poisoning.—Acute.** Symptoms. Taste of phosphorus in the mouth, odor of phosphorus on the breath, thirst, fever, gastro-enteritis, sometimes constipation, enlarged liver, remission the third day, followed by renewed symptoms, coffee-ground vomiting; absence of bile, jaundice, constipation, diminished urine with albumin or blood and bile coloring matter. Nervous symptoms. Twitching, headache, convulsions, death in a few days or several weeks. Later wholesale fatty degeneration.

**Treatment.** Emetics, stomach pump, purgatives, copper sulphate, hydrogen peroxide, potassium permanganate, old French oil of turpentine, magnesia, charcoal, stimulants.

**Poisoning.—Chronic.** Symptoms. Maxillary necrosis, etc.

**Administration.** The drug is given usually three times daily after meals. It is commonly administered in pills. The elixir is a good preparation. Begin with small doses, and gradually increase. Calcium phosphate, forming fifty per cent. of bone, increases the alkalinity of the blood, and diminishes the amount of urea. Sodium phosphate increases secretions generally, especially that of bile. Hypophosphites are stimulating to the circulation and nervous system.





**Therapeutics.** Neurasthenia, paraplegia, locomotor ataxia, neuralgia of the fifth nerve, osteomalacia, rachitis, insomnia of cerebral anemia, functional impotence (4).

#### OLEUM MORRHUAE.

1. **External Action.** On the skin it is bland, but is readily absorbed when rubbed in on account of the bile salts, which render it more permeable to animal membranes.

2. **Internal Action.—Digestive Tract.** In the stomach it may be nauseating, and is not absorbed. In the intestines it is emulsified, and is readily absorbed by the lacteals. It tends to produce laxativeness. As a fatty food it aids digestion.

3. **Blood.** It is a valuable hematinic, increasing the number of red blood corpuscles.

*Antagonists*—Mercury, etc. *Synergists*—Iron, arsenic, etc.

4. **Nervous System.** It is a food and tonic to nervous tissues.

*Synergist*—Glycero-phosphates.

5. **Metabolism.** The oil has alterative properties (iodine). It is a stimulant to protoplasm, increasing the output of waste material. Urea is increased. The drug is readily oxidized in the body, the patient gaining in weight.

**Untoward Action.** Besides derangement of the digestive tract, the drug may cause an eczematous rash.

**Administration.** The pure oil is usually best administered, and should be given at first in small doses, which should be gradually increased as tolerance is established by the stomach. As the presence of the oil in the stomach may interfere with digestion, and as it

is not digested until it reaches the intestines, it should never be administered until gastric digestion is about completed, say in one-half to two hours after meals. Where the taste is repulsive, emulsions may be used or the oil may be given in capsules.

**Therapeutics.** Certain skin diseases (1); marasmus, rachitis, wasting diseases, pertussis (1, 3, 5); tuberculosis, scrofula, chronic bronchitis, anemia, abscess and exhausting conditions, certain nervous diseases, chronic nephritis, convalescence from acute diseases, catarrhal conditions (2, 3, 4, 5).

**Contra Indications.** When it causes indigestion, fevers.

#### GOLD AND SODIUM CHLORIDE.

Its action is not definitely understood. It increases the fullness and frequency of the pulse, increasing arterial tension, and acting as an alterative and nerve tonic. If the dose is excessive or prolonged, gastrointestinal inflammation or inflammation of other organs may be caused.

**Administration.** It is given as pill, in solution or hypodermically.

**Therapeutics.** As a nerve tonic in neurasthenia, hysteria, neuralgia, alcohol habit, as an alterative in syphilis, scrofula, chronic rheumatism, chronic joint disease, degeneration of organs, spinal and cerebral sclerosis.

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#### ANTIPERIODICS.

##### CINCHONA. (Quinine.)

*Incompatibles*—Tannic acid, alkalies, alkaline earths, iodine. Infusion and decoction with Fowler's solution.

1. **External Action.** It is an antiseptic, and is irritant to broken skin and mucous membranes, but has no effect on the unbroken skin.







2. **Internal Action.—Digestive Tract.** Like the bitters, it is stimulant to gastro-intestinal glands, peristalsis and local blood supply. Large doses may irritate the stomach. It is precipitated in the alkaline juices of the intestines.

*Antagonists*—Belladonna, opium, etc. *Synergists*—Bitters, strychnine, etc.

3. **Circulation.** At first small doses increase the force and frequency of the heart, and raise arterial tension. Large doses depress, toxic doses paralyze. In the blood it is kept in solution by the carbonic acid. Migratory movements of the white blood cells in the vessels are checked, but not outside. The red blood cells are increased in number, and their oxygen-carrying power is diminished. The plasmodium is destroyed.

*Antagonists*—Cardiac stimulants. *Synergists*—Cardiac depressants.

4. **Nervous System.** It is a cerebral stimulant in small doses, a cerebral congestant in large doses. Reflexes are diminished by stimulation of the inhibitory center, later by direct depression of the spinal cord and nerves. "Nervousness" is sometimes produced by stimulation of the peripheral sensory nerve terminals.

*Antagonists*—Nerve stimulants. *Synergists*—Nerve depressants.

5. **Respiration.** Moderate doses have no effect, large doses depress.

6. **Temperature.** No effect in the normal body. It lowers fevers from certain causes, e. g., malaria. It is not an universal antipyretic.

7. **Uterus.** It increases the natural contractions of labor after they have begun. The drug probably does not produce abortion.

*Antagonists*—Viburnum, opium, etc. *Synergists*—Ecbolics.

8. **Eye.** The drug occasionally causes amblyopia, transitory blindness, color-blindness, dilated pupils.

2. **Absorption and Elimination.** It is quickly absorbed from the stomach. It is partly destroyed in the body, the rest is slowly eliminated by the kidneys chiefly. It lessens tissue waste, reducing the nitrogenous products in the urine.

**Untoward Action.** Ringing in the ears, deafness, blindness, skin eruptions, irritable bladder, gastritis, middle ear hemorrhages.

**Poisoning.—Cinchonism.** Symptoms. Similar to untoward action. If the dose be lethal, cardiac and respiratory failure and collapse.

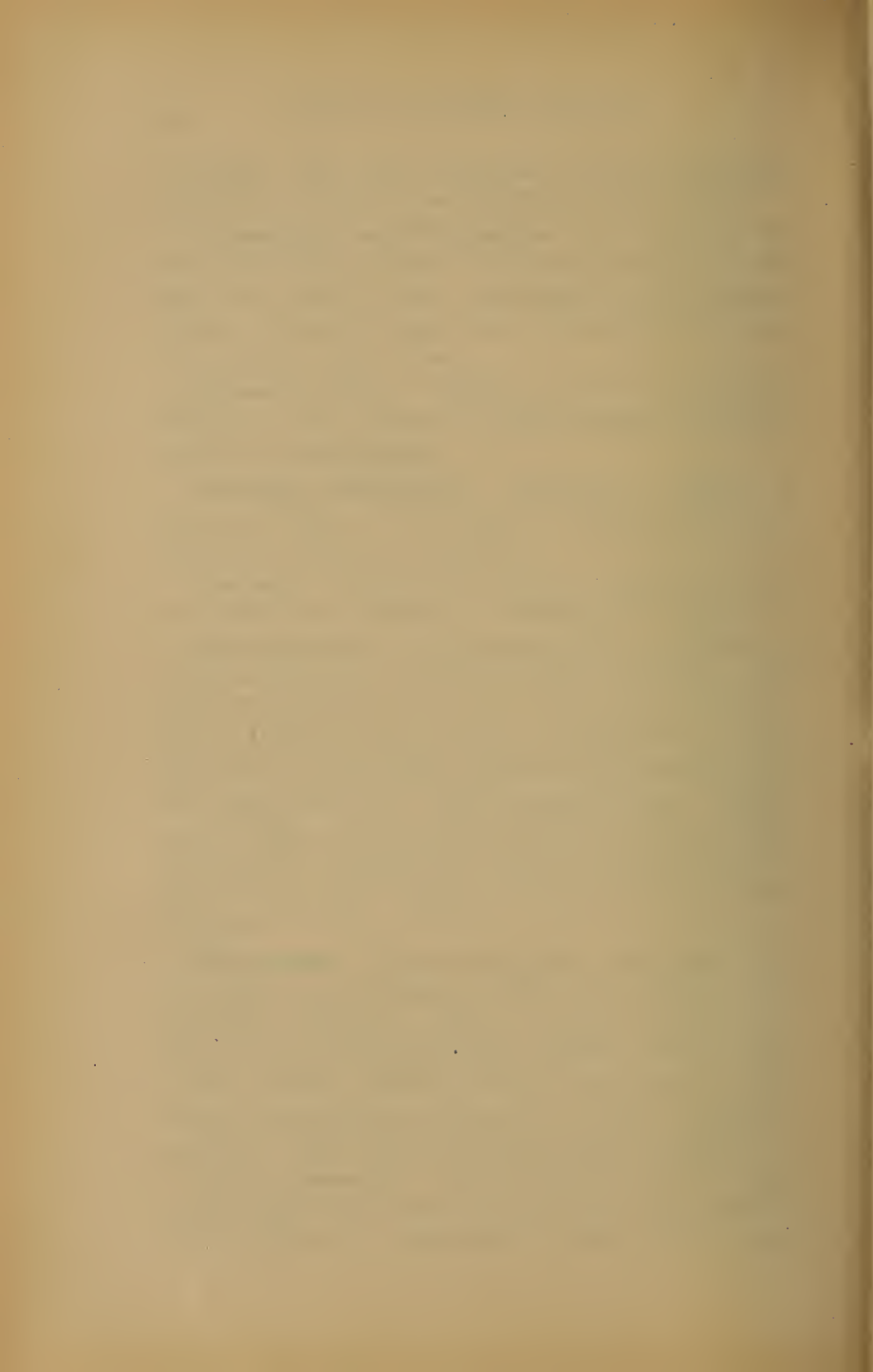
**Treatment.** Potassium bromide, hydrobromic acid and cardiac and respiratory stimulants if needed.

**Administration.** For administration to children it should be suspended in aromatic elixir of licorice. For adults it should be given in the dry powder or in capsules. The drug may be given as a suppository mixed with lard or by inunction. Quinine hydrobromate and the hydrochlorate are used hypodermically. Caution must be observed when thus used on account of cardiac depression. Aromatics and spices increase the efficiency of the drug. Quinine is best given on an empty stomach.

**Therapeutics.** Alopecia, hay fever, whooping-cough, etc., gonorrhea, erysipelas, cystitis (1); malaria (3, 6); neuralgias, headache, asthma, jaundice, diarrhea, dysentery, etc., of malarial origin, phthisis, fistulae, septicemia, pyemia, puerperal fever, first stage of endocarditis, pneumonia, pleurisy (3); chorea, whooping-cough (4); labor, amenorrhea (7); atonic dyspepsia (2).

**Contra Indications.** Acute inflammation of the gastro-intestinal and genito-urinary tract, inflammation of the middle ear, meningitis, cerebritis, idiosyncrasy.





**METHYLENE BLUE.**

The drug is an efficient substitute for quinine in malaria where quinine has failed, or where idiosyncrasy contraindicates. The drug is an antiseptic.

**Absorption and Elimination.** It is quickly absorbed, and is eliminated by the bowels and kidneys, staining the excretions blue. It is thus an antiseptic of the urinary tract.

**Untoward Action.** Nausea and vomiting, vertigo, stranguary.

**Administration.** In capsules every four to six hours. A few drops of spirit of peppermint or other aromatic usually prevents untoward symptoms.

**Therapeutics.** As a substitute for quinine in malaria affections, in gonorrhea, cystitis, etc.

## DRUGS HAVING LOCALIZED ACTION.

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### BITTERS.

#### SIMPLE BITTERS.

*Incompatibles*—Salts of iron, lead and silver with gentian, calendula and aromatic bitters.

Quassia, gentiana, calumbo (columba), calendula (marigold), chirata.

**External Action.** None.

**Internal Action.**—**Digestive Tract.** In the mouth they stimulate the afferent nerve terminals, and cause an increased secretion of saliva and gastric juice, by reflex action through the medulla and the vasomotor center and secretory nerves. In the stomach by local action secretion is further stimulated in a like manner. Through increased local blood supply absorption is increased. By reflex stimulation of Auerbach's plexus, peristalsis is increased.

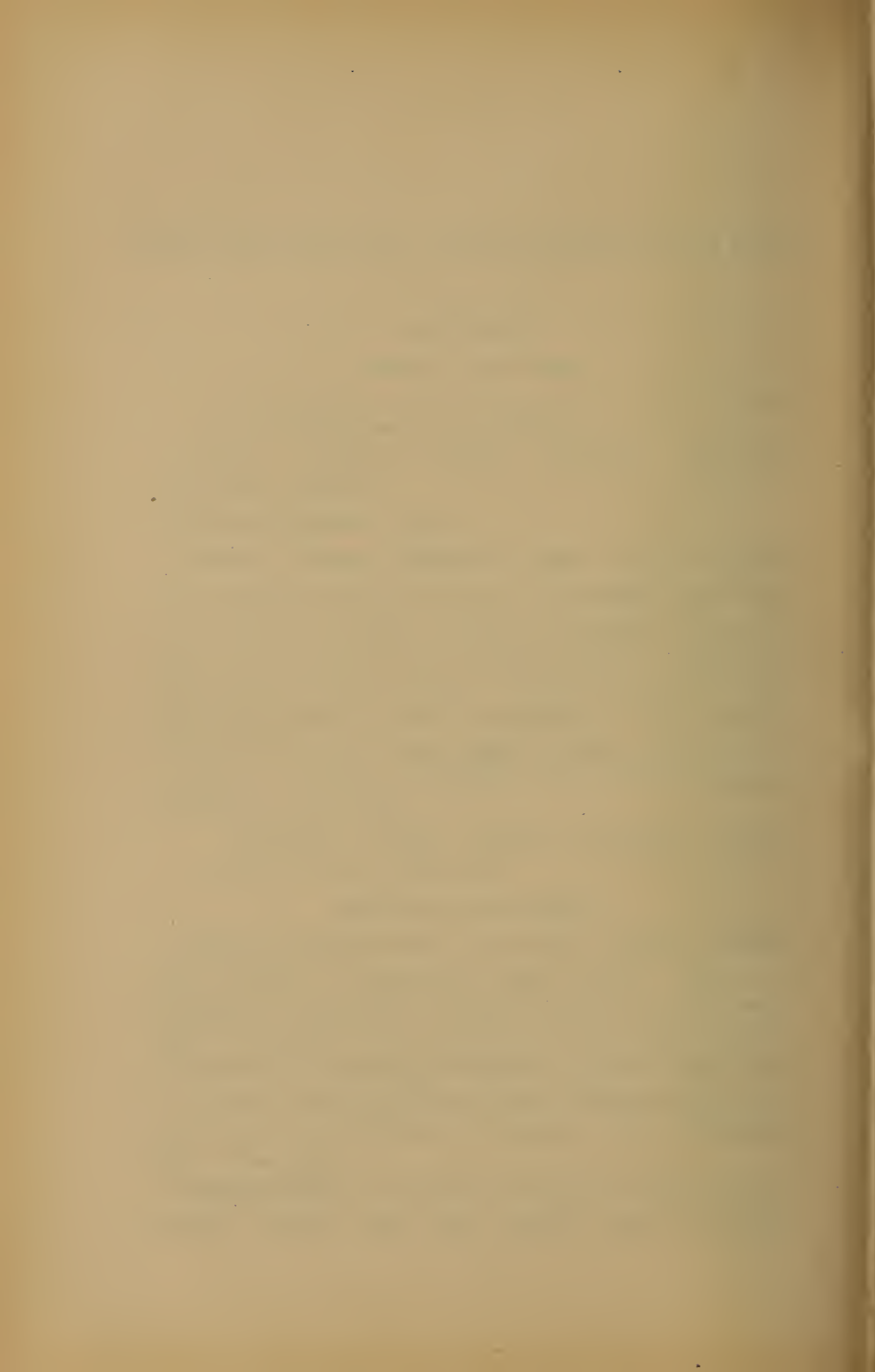
*Antagonists*—Opium, astringents, belladonna. *Synergists*—Strychnine, physostigma.

#### AROMATIC BITTERS.

Anthemis (chamomile), cascarilla, prunus virginia (wild cherry), serpentaria (snake root). These, in addition to the action of simple bitters, are also antiseptic by reason of the volatile oil which they contain. In overdose or too long continued, aromatic bitters act as irritants, lessening the secretion of gastric juice, and increasing the secretion of mucus. [See "Volatile Oils," Class II.]

**Administration.** They are best given in liquid form, though powders and solid extracts may be given.







They are best administered one-half to one hour before meals.

**Therapeutics.** Atonic and fermentative dyspepsia, chronic gastric catarrh, anorexia, convalescence, delirium tremens.

Quassia for seat worms. Wild cherry in bronchitis and phthisis.

**Contra Indications.** Organic diseases of the stomach, during fevers, when appetite is good, alcoholic preparations in drunkard's catarrh, intestinal indigestion.

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## DIGESTANTS.

### PEPSINUM.

*Incompatibles*—Tannic and gallic acid, mineral salts, alcohol, alkalies.

**Action.** Its action, which is purely chemical, occurs in an acid medium of a strength not exceeding one-fifth of one per cent. It digests proteids, forming albumoses, and then peptones.

**Administration.** In powder, dissolved in glycerin or acidulated water, immediately after meals. If too long continued, it will impair the gastric function.

**Therapeutics.** Atonic dyspepsia, cancer and ulcer of the stomach, peptonized food by rectum.

### PANCREATINUM.

*Incompatibles*—Strong mineral acids.

**Action.** Its action, which is chemical, occurs in an alkaline or very weak acid medium. It digests proteids, emulsifies fats and oils, resolving them into fatty acids and glycerin, converts starch into sugar, and curdles milk.

**Administration.** In powders, capsules, or in solu-

tion with alkalies. It should be given two hours after meals or immediately after or with food.

**Therapeutics.** As for pepsin.

#### DIASTASE.

**Action.** Its action is chemical. It converts starch into sugar until the acidity of the gastric juice reaches .1 of one per cent.

**Administration.** Taka-diastase is the best preparation, and may be given in tablets, capsules or solution.

**Therapeutics.** "Amylaceous indigestion."

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#### EMETICS.

**Local.** Alum, copper sulphate, zinc sulphate, yellow mercuric sulphate, sodium chloride, ammonium carbonate, mustard.

**Systemic.** Apomorphine hydrochlorate, antimony and potassium tartrate, ipecac, lobelia.

#### ANTIMONY AND POTASSIUM TARTRATE.

*Incompatibles*—Tannic and gallic acids, lead salts.

1. **External Action.** Irritant to the skin, causing burning sensation, continued application causes inflammation, acne, vesicular and pustular eruptions like small-pox.

*Antagonists*—Emollients. *Synergists*—Irritants.

2. **Internal Action.** An irritant to mucous membranes.

**Digestive Tract.** Small doses produce a sense of warmth, increasing salivary, gastric and intestinal secretions. In full doses the drug is an irritant, and by its local action is a slow, but powerful emetic, producing similar effects by stimulating the vomiting





center after absorption. It may cause purging and cramps.

*Antagonists*—Bismuth, cerium oxalate, hydrocyanic acid.

*Synergists*—Emetics.

3. **Nervous System.** It paralyzes all of the spinal centers, sensory and motor, sensory peripheral nerve terminals, and motor nerves. Heat sensation is first lost. Convulsions may occur, due to cerebral anemia. The drug is a general muscle poison.

*Antagonists*—Strychnine, caffeine, belladonna. *Syner-*

*gists*—Chloral, physostigma, bromides, etc.

4. **Circulation.** Pulse rate and pulse force lowered by the depression of heart muscle. Arterial tension is lowered by depression of the peripheral vasomotor terminals in the vessels, and possibly by depression of the vasomotor center; also by decrease in heart force.

*Antagonists*—Digitalis, strychnine, belladonna, ergot.

*Synergists*—Aconite, veratrum, etc.

5. **Respiration.** Small doses stimulate bronchial secretions, but have little effect on the movements; large doses further stimulate bronchial secretions and by depression of the center render movements irregular. Poisonous doses produce death in three ways, by depression of the respiratory center and the pneumogastric nerve, by pulmonary congestion due to cardiac failure, and by excessive bronchial secretions which cannot be expelled (drowning).

*Antagonist*—Belladonna. *Synergists*—Expectorants.

6. **Temperature.** Unaffected by small doses, large doses cause a fall through the effect on the circulation.

7. **Absorption and Elimination.** The drug is rapidly absorbed, and is eliminated by all avenues; by bowels (purging), by skin (eruption like variola), by lungs (expectorant).

**Untoward Action.** Like poisoning.

**Poisoning.** Symptoms. Like cholera, pulse slow and weak at first, skin moist, muscles relaxed, vomiting, gastric distress, purging with rice water stools, face wet and livid, pulse becomes rapid and shuttle-like, or absent at the wrist, arterial tension is nothing, respiration is faint and fleeting, cramps in the calves of the legs, temperature is lowered.

**Treatment.** Tannic acid, stomach pump, prone position, external heat, alcohol, digitalis, opium (hypodermically) with strychnine if respiration is very feeble.

**Diagnosis from Cholera.** By chemical examination and history.

**Administration.** As an expectorant the wine is as good as any other preparation. Give every two to three hours. As an emetic give with ipecac in powder.

**Therapeutics.** Acute inflammations, first stage of acute laryngitis, croup, bronchitis (4, 7); any conditions requiring an emetic (2). This drug is becoming less and less used.

#### APOMORPHINE.

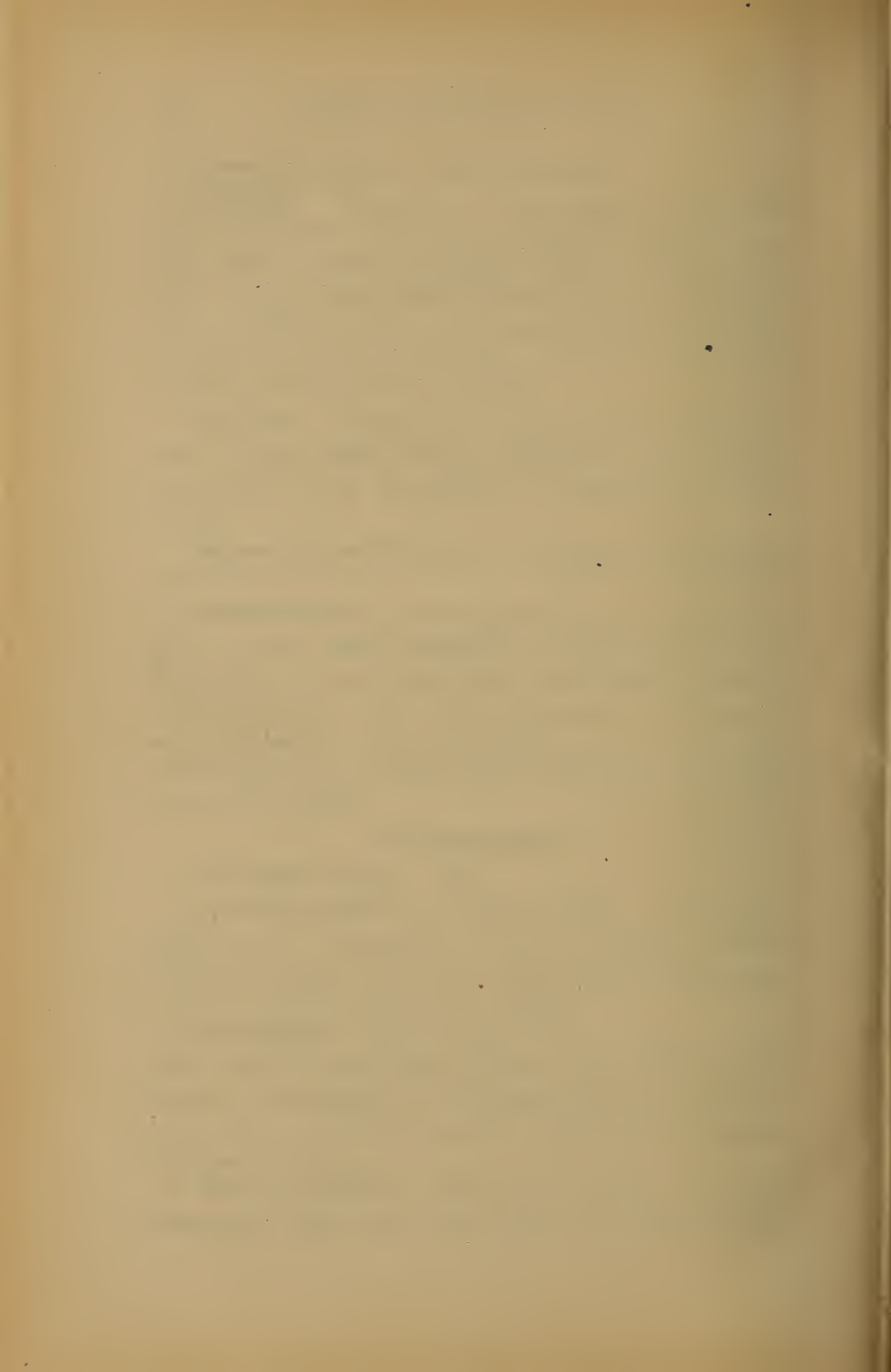
1. **External Action.** None.

2. **Internal Action.** No effect locally. Vomiting is produced by stimulation of the vomiting center. Emesis is usually repeated several times, nausea occasioned is slight, depression moderate.

3. **Circulation.** Small doses have no effect. Full doses increase heart force and rate, and raise arterial tension (stimulation of the heart muscle, accelerator nerve, and vasomotor center). Large doses depress the heart muscle.

4. **Nervous System.** Full doses stimulate the brain (delirium), large doses cause convulsions, followed by







motor and sensory paralysis. Vomiting center stimulated.

*Antagonists*—Bromides, chloral, etc. *Synergists*—Emetics.

5. **Respiration.** Small doses increase secretions from the bronchial mucous membranes, full doses stimulate the respiratory movements, large doses depress.

*Antagonists*—Belladonna, opium. *Synergists*—Expectorants.

6. **Absorption and Elimination.** It is quickly absorbed, and is eliminated by gastro-intestinal tract, the bronchial mucous membrane, the kidneys and the skin.

**Poisoning.** Symptoms. Vomiting (very violent), delirium and convulsions, cardiac and respiratory depression.

**Treatment.** Gastric sedatives, cardiac and respiratory stimulants.

**Administration.** For emesis give hypodermically. For expectorant effect give by the mouth. Always use freshly prepared solution. Children bear apomorphine badly.

**Therapeutics.** Poisoning, as emetic in irritated condition of the stomach (2); acute and chronic bronchitis, etc. (5).

**Contra Indications.** As for other emetics.

#### IPECACUANHA.

*Incompatibles*—Tannic acid, metallic salts and caustic alkalies.

1. **External Action.** It is irritant to the skin, producing, if long continued, vesication and pustulation.

*Antagonists*—Emollients, astringents. *Synergists*—Irritants.

2. **Internal Action.** It is irritant to mucous membranes, causing sneezing and asthma when inhaled.

**Digestive Tract.** It is a local irritant in the mouth,

causing salivation. In the stomach minute doses are stimulating, larger doses by local action cause vomiting without much nausea. This effect is further produced after absorption by action on the vomiting center in the medulla. In the intestines it acts as a purgative. In small doses it increases the flow of bile.

*Antagonists*—Cocaine, cerium oxalate, bismuth, etc. *Synergists*—Emetics, purgatives.

3. **Circulation.** No direct effect from medicinal doses.

4. **Nervous System.** Stimulation of the vomiting center is the only effect of medicinal doses.

*Antagonists*—Bromides, chloral, etc. *Synergists*—Emetics.

5. **Respiration.** No effect on the respiratory movements. It stimulates the bronchial mucous membrane increasing the secretions, which reflexly increases the cough.

*Antagonists*—Belladonna, codeine, etc. *Synergists*—Expectorants.

6. **Absorption and Elimination.** The drug is rapidly absorbed, and is eliminated by the bowels, by the skin (stimulation of the sweat glands), by the kidneys, and by the lungs.

7. **Uterus.** In small doses the drug is oxytocic.

**Untoward Action.** Cutaneous irritation, conjunctival inflammation.

**Poisoning.** Symptoms. Vomiting and purging with blood, pain, cardiac depression, muscular weakness, diminished reflexes, cold sweat, lowered temperature.

**Treatment.** Tannic acid, external heat, opium, belladonna, cardiac stimulants.

**Administration.** The powder is the best form in which to administer as an emetic or diaphoretic. The





syrup or the wine are better as expectorants. Administer every three to four hours. Children bear ipecac well.

**Therapeutics.** Croup, bronchitis, sick headache, vomiting, atonic dyspepsia, bilious dysentery, infantile diarrhea, hematemesis (2); rigid os uteri (7); hemoptysis, late stages of pneumonia, bronchitis, spasmodic asthma (6); remittent and intermittent fevers.

**Contra Indications.** Aneurism, hernia, prolapses.

### LOBELIA.

*Incompatibles*—Caustic alkalies.

**Internal Action.**—**Digestive Tract.** It is an irritant emetic like ipecac, but it causes more nausea and prostration.

**Circulation.** It depresses the heart muscles and the vasomotor center, lessening force and tension of the pulse. Poisonous doses paralyze.

**Nervous System.** Full doses depress the motor nerve ganglia. Poisonous doses cause coma and convulsions.

**Respiration.** It is slowed by small doses, is depressed or paralyzed by large doses. Bronchial muscular coats are relaxed.

**Absorption and Elimination.** It is readily absorbed, and is eliminated by the kidneys and skin, acting as a diuretic and diaphoretic.

**Poisoning.** Symptoms. Gastro-enteritis with collapse.

**Treatment.** Cardiac and respiratory stimulants, external heat, etc.

**Administration.** Any of the preparations may be used, but the drug is not much employed.

**Therapeutics.** Spasmodic asthma and bronchitis.

L. of C.

**COPPER SULPHATE AND ZINC SULPHATE.**

*Incompatibles*—Alkalies and their carbonates, sulphides, lime water, vegetable astringents. Copper further with iodides and mineral salts except sulphates. Zinc with silver nitrate, lead acetate and milk.

1. **External Action.** On the unbroken skin they have little effect. On mucous membranes and on the broken skin they are powerfully astringent or mildly caustic, zinc being milder than copper.

*Antagonists*—Emollients. *Synergists*—Caustics, etc.

2. **Internal Action.** They are irritant to the mucous membrane of the stomach. By reflex action they produce vomiting without much nausea. Unless promptly effective some other emetic should be used to empty the stomach and to prevent irritation. A second dose of zinc may be given, however. In the intestines in small doses they are astringent, but in large doses they are violently irritant.

*Antagonists*—Bismuth, cerium oxalate, etc. *Synergists*—Emetics.

3. **Absorption and Elimination.** When either drug is used as an emetic there is practically no absorption. With small doses absorption is slow, the drug tending to cumulate in the liver, zinc much less than copper. Both are sedative to the nervous system. If the dose is too large, cardiac depression may be induced. Copper is a tonic to the blood. They are eliminated by the liver, the kidneys, the intestinal tract, and copper by the salivary glands.

**Untoward Action.** See "Poisoning."

**Poisoning.—Acute.** Symptoms. Metallic taste, gastric pain, vomiting (colored green or blue from copper), purging, with mucus and blood, convulsions, salivation, headache, jaundice, defective coördination, coma.







**Treatment.** Potassium ferro-cyanide, albumin, oil, magnesium, opium, alkalies and their carbonates, stomach pump.

**Poisoning.—Chronic** (rare). Symptoms. Bronchial and intestinal catarrh, colic and diarrhea, nausea, emaciation, anemia, paralysis, atrophy and fatty degeneration of the liver, green line on the gums from copper.

**Treatment.** Hygiene, tonics, stimulants, potassium iodide.

**Administration.** As an emetic, five to ten grains well diluted. As an internal astringent, one to two grains with opium. In the eye use a solution of five grains to one ounce.

**Therapeutics.—Copper Sulphate and Zinc Sulphate** in ulcers, ring-worm, scabies, sore throat, conjunctivitis, stomatitis, gonorrhea, gleet (1), to produce emesis, croup, dysentery, diarrhea (2), chorea, hysteria, epilepsy, anemia (3). **Zinc Acetate** in conjunctivitis, gonorrhea (1). **Zinc Carbonate** in moist skin diseases (1). **Zinc Chloride** in certain eye diseases and gonorrhea. **Zinc Oxide** in eczema, burns, fissured nipples, anal fissure, ulcers, erysipelas, leucorrhea (1), diarrhea, dysentery (2), hysteria, spasmodic asthma, chorea, epilepsy, whooping-cough, delirium tremens (3).

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## ANTI-EMETICS.

**Local.** Alcohol, arsenic (small doses), belladonna, bismuth subnitrate and subcarbonate, cerium oxalate, carbolic acid, chloroform, cocaine, creosote, calomel, ether, ipecac (small doses), ice, opium, hydrocyanic acid, menthol, potassium nitrate, silver nitrate, sulphocarbolates, tincture of iodine (small doses).

**Systemic.** Alcohol, ammonia, amyl nitrite, bromides, chloral, hydrocyanic acid, nitroglycerin, opium.

## CATHARTICS.

**General Manner of Action.** Saline cathartics, if stronger than the normal saline solution, abstract water from the blood vessels in the intestinal canal. Other cathartics act by stimulating peristalsis, producing intestinal hyperemia, and increasing glandular activity. Cathartics are classified, according to the degree of their action, under the usual dosage as: laxatives, simple purgatives, hydragogue purgatives and drastic purgatives, but it must be remembered that this classification is based on their degree of activity, and that large doses of simple purgatives, for instance, may be hydragogue, and that small doses of hydragogues may act as laxatives only. Most cathartics act by immediate contact with the intestinal mucous membrane, some, noted below, in the course of excretion.

*Antagonists*—Opium, belladonna, astringents. *Synergists*—Strychnine, volatile oils, etc.

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## LAXATIVES.

## OLEUM RICINI.

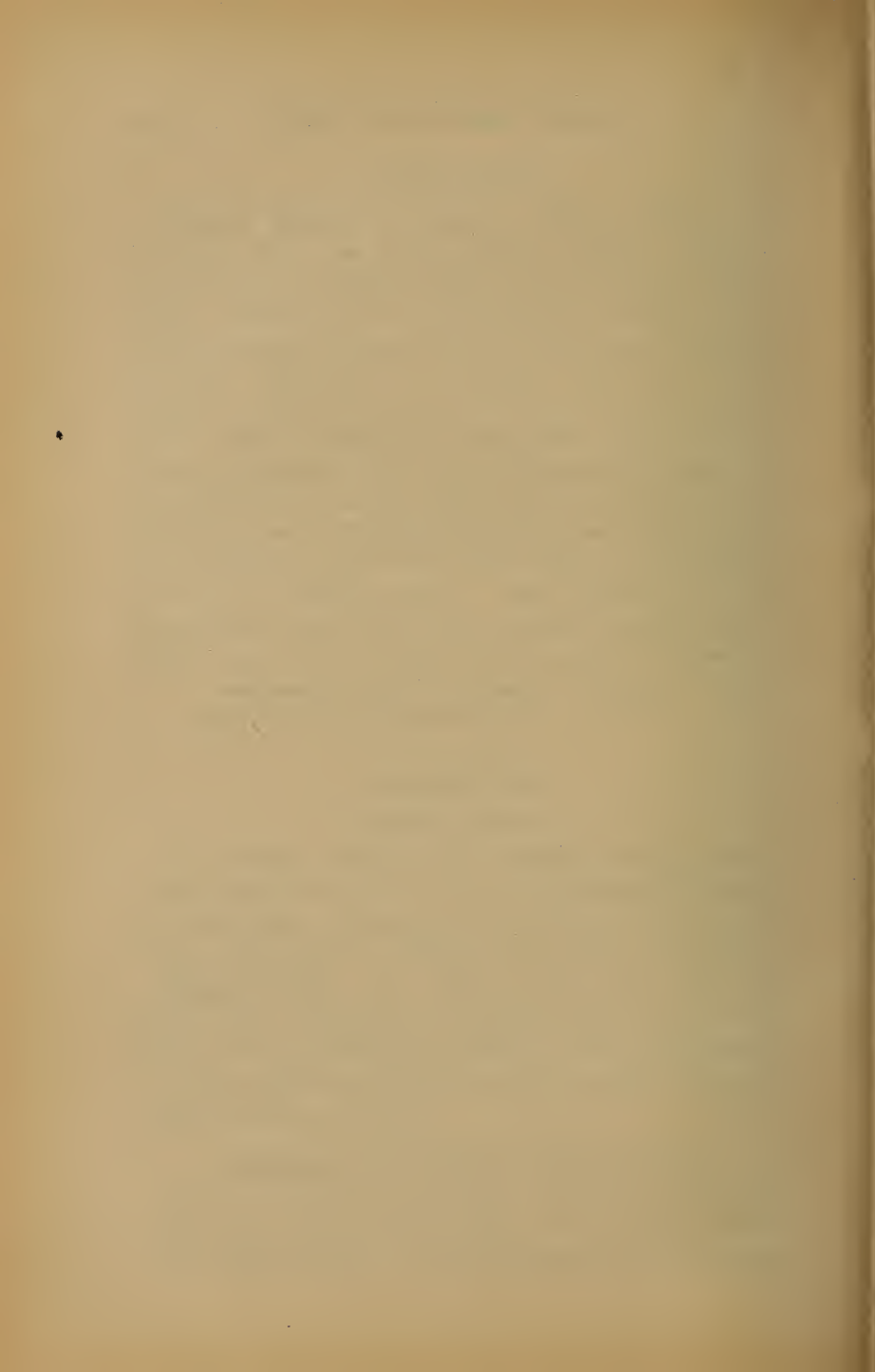
It is mildly irritant to the intestinal mucous membrane, and acts in from four to six hours, usually without much pain. It acts on the small intestine directly and in elimination. Habitual use causes constipation.

**Administration.** To disguise the taste mix with equal parts of glycerin or aromatic elixir, with a few drops of oil of cinnamon added or oil of peppermint. It may be given in whiskey, beer, or coffee, or in capsules, but these are bulky.

## RHAMMUS PURSHIANA. (Cascara Sagrada.)

Owing to the bitter principles which this drug contains it is a stomachic stimulant, and is mildly irritant to the small intestine. It acts in from six to ten hours,





usually without pain, and does not increase constipation after purgative action. The solid or the fluid extract are the best preparations, and their activity may be increased by mixing with equal parts of glycerin, and by the addition of a few drops of spirit of peppermint. The cordials are not so efficient as the plain fluid extract. The drug may be given in capsules. For constipation, after a few days' use in regular dose, the amount should be gradually decreased.

#### **MANNA.**

Mildly irritating to the intestines. It is slow in its action, and tends to produce constipation after its laxative effect.

#### **SULPHUR.**

Parasiticide, antiseptic, and slightly irritant to the skin by the formation of hydrogen sulphide. In the intestines it is partially converted into sulphides, which stimulate secretion and peristalsis. It is very slow in its action, and may cause flatulence. It is eliminated chiefly by the intestines, but partially by the kidneys, lungs, skin and lacteal glands. May cause rash, and, if long continued, impairs the quality of the blood, and may cause muscular weakness. It may be administered as lozenges, in capsules, in milk or other vehicle, or in the form of baths.

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### **SIMPLE PURGATIVES.**

#### **ALOES.**

This drug is readily absorbed from the abraded skin. It stimulates gastric secretions somewhat. It stimulates the flow of bile, and exerts its principal action on the lower part of the large intestine in elimination. It stimulates peristalsis more than secretion. The drug acts slowly in from ten to fifteen hours, causing soft,

dark stools, with more or less griping. It is readily absorbed. Pelvic circulation is increased (hemorrhoids and abortion). Elimination chiefly by the bowels, and partially by the kidneys and milk. It is best administered in pill form.

#### **FEL BOVIS.**

Augments duodenal secretions, emulsifies fats, and increases peristalsis, and is an intestinal antiseptic. It is best given in pill form.

#### **RHEUM.**

In moderate doses it is a stomachic stimulant and bitter astringent. Its action on the small intestine is stimulation of the circulation of the glandular appendages and stimulation to the liver. It produces soft, yellow stools in from four to eight hours, with griping. By its astringent properties it increases constipation after purgative effect. It is excreted by the intestines, by the kidneys, skin and lacteal glands, all secretions being tinged yellow. It is best administered to children as syrup, to adults in pill form.

#### **SENNA.**

It stimulates the intestinal circulation, the intestinal secretion, and peristalsis throughout the small intestines, producing copious, liquid, yellow stools in six to eight hours, with griping and flatulence. It does not tend to constipation. The drug is eliminated by the intestines, by the kidneys, and by the lacteal glands. It colors the urine red. All preparations are used.

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### **HYDRAGOGUE PURGATIVES.**

#### **OLEUM TIGLII.**

Externally it is a powerful irritant to the skin, producing inflammation, with vesication and pustulation. Internally it produces a sensation of warmth in the







stomach. It causes congestion and hyperemia of the intestines, increasing the glandular activity and peristalsis. It produces profuse watery stools in from one-half to two hours. Large doses cause violent gastroenteritis, with collapse and the usual symptoms of irritant poisoning. Treat like other irritant poisons. It may be administered in emulsion or on sugar, but is best administered in pills made with bread crumbs. Purgative effects may be produced by external application.

#### **ELATERIUM. (Elaterin.)**

This is the most powerful of all of the hydragogue purgatives. It stimulates the salivary, gastric and intestinal secretions, and those from the liver and the pancreas. It is a violent purgative, and acts on the large intestine, producing prompt free watery stools, with much griping and prostration. It may be given in pill, in alcoholic solution or triturated, and must be used cautiously.

#### **CAMBOGIA.**

It is a violent hydragogue purgative, and stimulates peristalsis greatly, causing great increase in intestinal secretions. In small doses and repeated doses it is slightly diuretic, coloring the urine yellow. It may cause griping, and has anthelmintic properties.

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#### **SALINES.**

Magnesia, magnesium carbonate, magnesium citrate, solution of effervescent magnesium citrate, magnesium sulphate (Epsom salts), potassium tartrate, potassium and sodium tartrate (Rochelle salts), sodium phosphate, sodium sulphate (Glauber's salts).

Magnesia and magnesium carbonate are antacids, becoming mildly laxative after being acted upon by the

gastric juice. Their action is increased when they are administered with lemon juice. They are absorbed into the blood with difficulty, but when absorbed, they act as do the other alkalies.

The salines cause purgation by preventing absorption from the intestines when in weak solution, and by abstracting the water from the blood vessels into the intestines if in solution stronger than 7 to 1,000. Peristalsis is stimulated by the greater bulk in the intestines. Sodium sulphate and sodium phosphate are mild hepatic stimulants. Sodium salts are more active purgatives than potassium salts, producing watery stools in from one to three hours. The salines should be administered quite concentrated on an empty stomach.

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## DRASTIC PURGATIVES.

### COLOCYNTHIS.

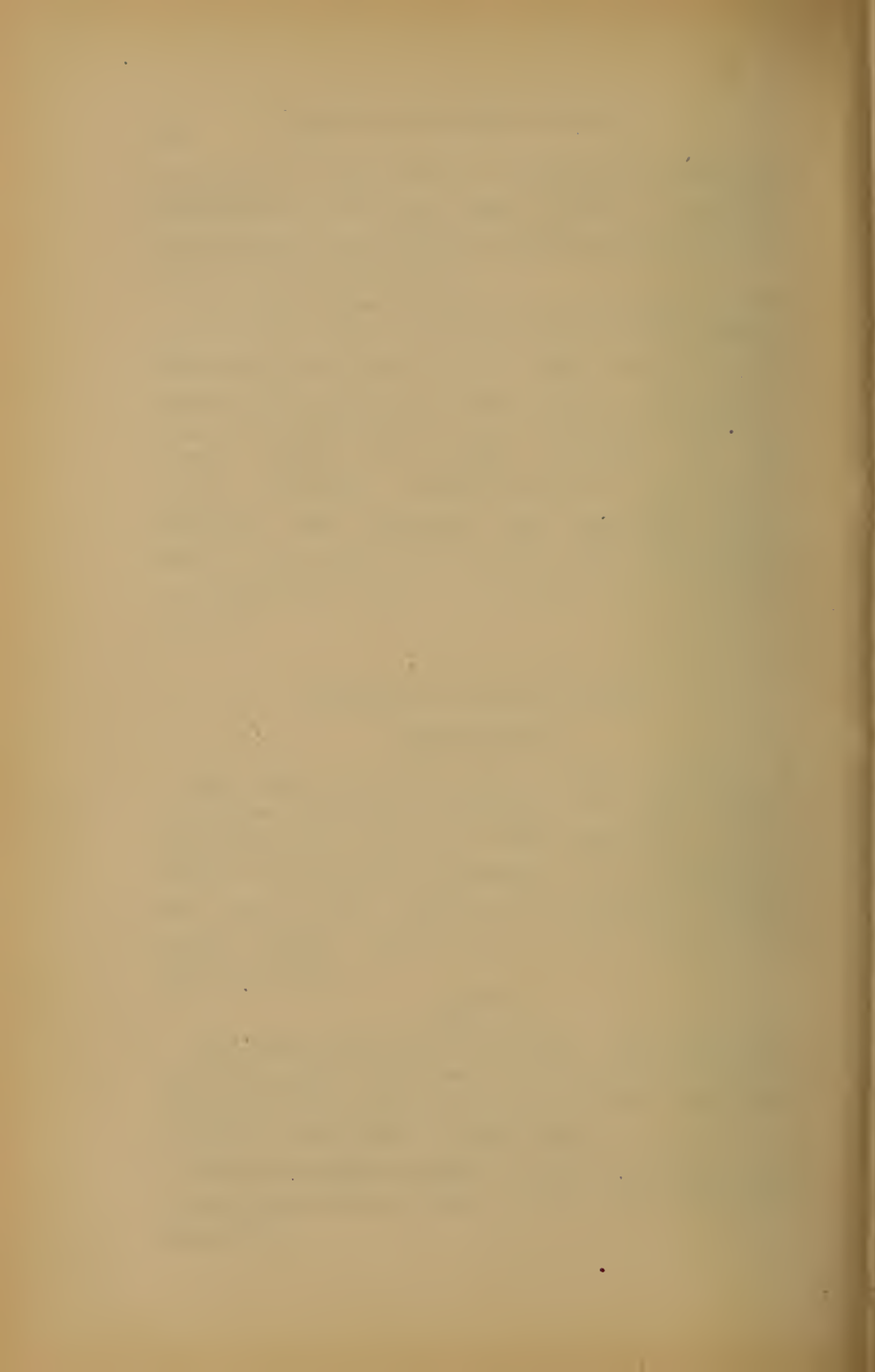
This drug is a harsh and powerful purgative. It stimulates secretions throughout the whole gastrointestinal tract, and causes violent peristalsis. It is a hepatic stimulant and cholagogue. It is eliminated by the liver and the intestines, and promptly produces watery stools. In large dose it will cause violent gastro-enteritis.

### JALAPA.

It is active in the small intestines. The drug stimulates intestinal secretions and circulation, and also peristalsis, producing profuse watery stools, with much griping, in. from three to four hours.

**Compound Jalap Powder** is usually preferred to the other preparations of jalap. It has some anthelmintic properties.





**SCAMMONIUM.**

Identical in its action with jalap, except that its effects on the muscular coat of the intestines is greater, thus causing more griping. It stimulates secretions. The drug is inactive in pill form, and should be given in powder or emulsion.

**PODOPHYLLUM.**

This drug is irritant to the skin, and to mucous membranes when inhaled. It may be absorbed from raw surfaces, and produce purgative effect. When swallowed, it is apt to cause nausea. It exerts its effect in the small intestine, rendering peristalsis very rapid, and greatly increasing the secretions, especially the bile. It produces liquid, bile-stained stools in from ten to twelve hours, with much griping. It should be combined only with other slow acting drugs.

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**ADMINISTRATION OF CATHARTICS IN GENERAL.**

These drugs should be so combined as to affect the entire intestinal tract. Hyoscyamus or belladonna should be given with those which cause griping. Their action is more prompt if they are administered upon an empty stomach, the salines by preference before breakfast, the slow-acting purgatives at bed-time.

**Therapeutics.** Simply to remove feces (laxatives); to relieve chronic constipation (aloes, cascara, magnesia, sodium phosphate, podophyllum); to remove pathogenic matter from the bowels (mercurial preparations); to stimulate the liver (aloes, podophyllum, sodium phosphate, colocynth); to deplete the gastroduodenal membrane (sodium salts and other salines); to remove dropsical effusions (hydrogogue purga-

tives); to supplement inefficient elimination of urea, etc. (drastic purgatives); to increase menstrual flow (aloes).

**Contra Indications.** Inflammation of the mucous membrane of the gastro-intestinal tract. Hydragogue or drastic purgatives in appendicitis, peritonitis, pregnancy, intussusception, etc.

**Therapeutics other than cathartic:**

**Castor Oil.** Protective dressing in superficial ulceration.

**Sulphur.** Locally, certain diseases of the skin, nose and throat. Internally, in bronchitis, chronic rheumatism, eczema.

**Croton Oil.** Locally in intercostal neuralgia, chronic bronchitis, congestive dysmenorrhea, congestion of the uterus.

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## ANTHELMINTICS.

These drugs are used to expel or kill the intestinal worms.

### CHENOPODIUM.

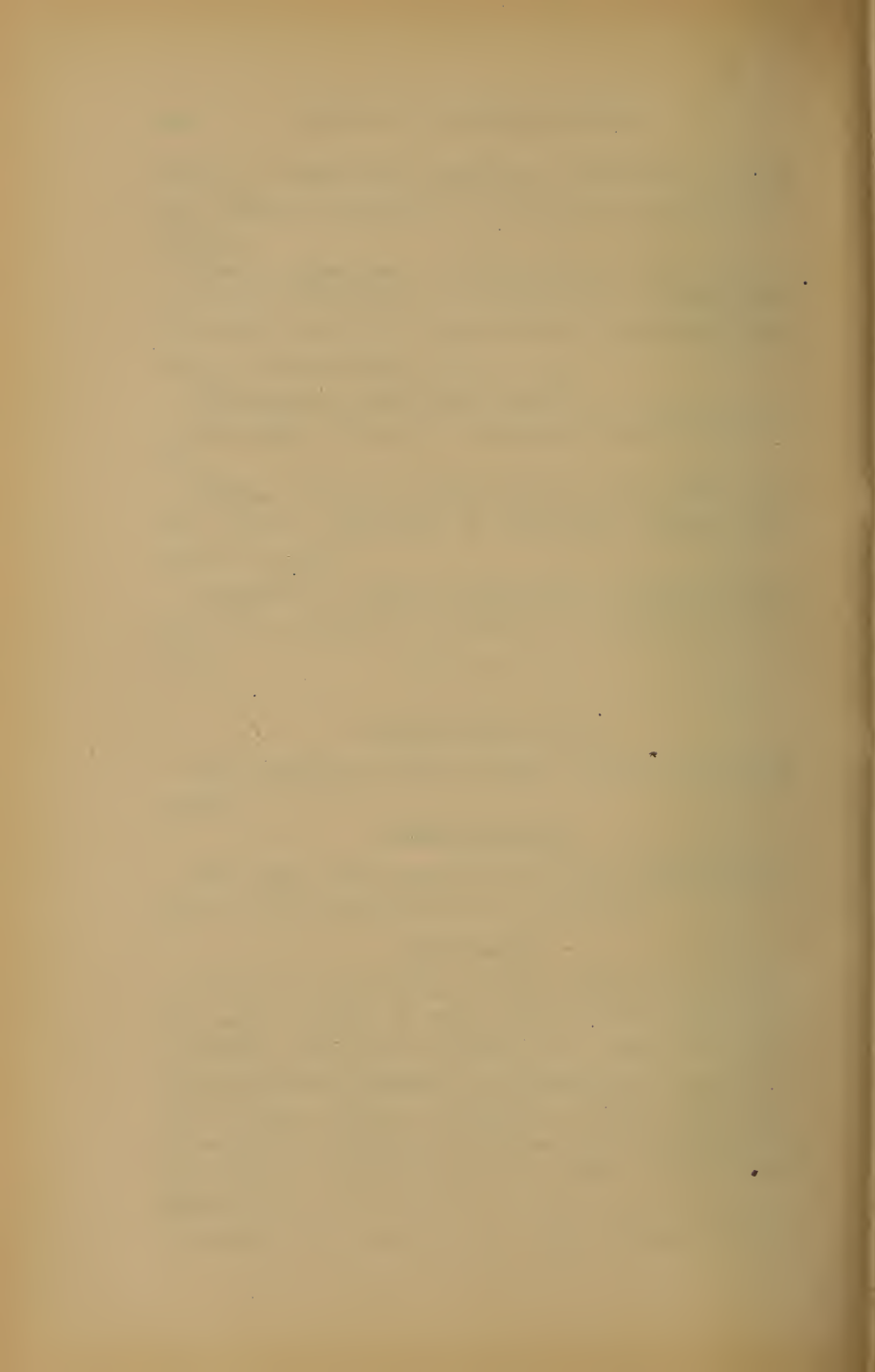
This drug expels round worms, and should be followed in its administration by a cathartic.

### SANTONICA.

Is used to expel round worms. The drug is irritant, and may, if given in large doses, cause nausea and vomiting, with pain, diarrhea, etc. Large doses may cause giddiness, headache, hallucinations of smell and taste, yellow vision or perception of other colors may be induced. Sometimes urticaria. It is eliminated by the kidneys, coloring the urine yellow if acid, red if alkaline.

It should be given on an empty stomach, and is







usually accompanied by calomel, and followed in a few hours by some other brisk cathartic.

**Poisoning.** Symptoms. Unconsciousness, twitching of the eye-balls, dilated pupils, cold sweat, weak pulse, feeble respiration and sudden death.

#### **SPIGELIA.**

It causes the expulsion of the round worm. It should be combined with cathartics and aromatics to prevent absorption, which may induce the symptoms of narcotic poisoning.

#### **ASPIDIUM.**

This drug causes the expulsion of the tape worm, and may be administered in emulsion or in capsules. In large doses it is irritant to the gastro-intestinal tract. For efficiency the drug should be given after at least twenty-four hours of practical fasting, by preference in the morning, and preceded the night before by a brisk purge. A few hours after its administration another brisk purge should be given to aid in the expulsion of the worm. If the head does not come away, the treatment must be shortly repeated.

#### **CUSSO.**

Similar in its effects and administration to aspidium.

#### **GRANATUM.**

This is an efficient anthelmintic against the tape-worm. A decoction of the bark is the usual form of administration, but it is efficient only when the drug is fresh. Otherwise it is like aspidium. Tannate of pelletierine is more reliable.

#### **KAMALA.**

This drug is effective against all kinds of worms, and in its administration resembles aspidium.

**PEPO.**

Causes destruction and expulsion of tape-worms. An infusion of the crushed seed is used, about a pint being administered in from three to four doses at intervals of from one to two hours. In its administration it resembles aspidium.

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**HEMATICS.**

Iron, manganese, phosphorus, cinchona, arsenic, cod liver oil.

**FERRUM.**

*Incompatibles*—Ferric salts with tannic and gallic acids and acacia. Carbonates with acids and acidulous salts. Iodides and salts of vegetable acids with tannic and mineral acids, alkalies and their carbonates. Tincture of the chloride with tannic acid, alkalies and their carbonates, lime water.

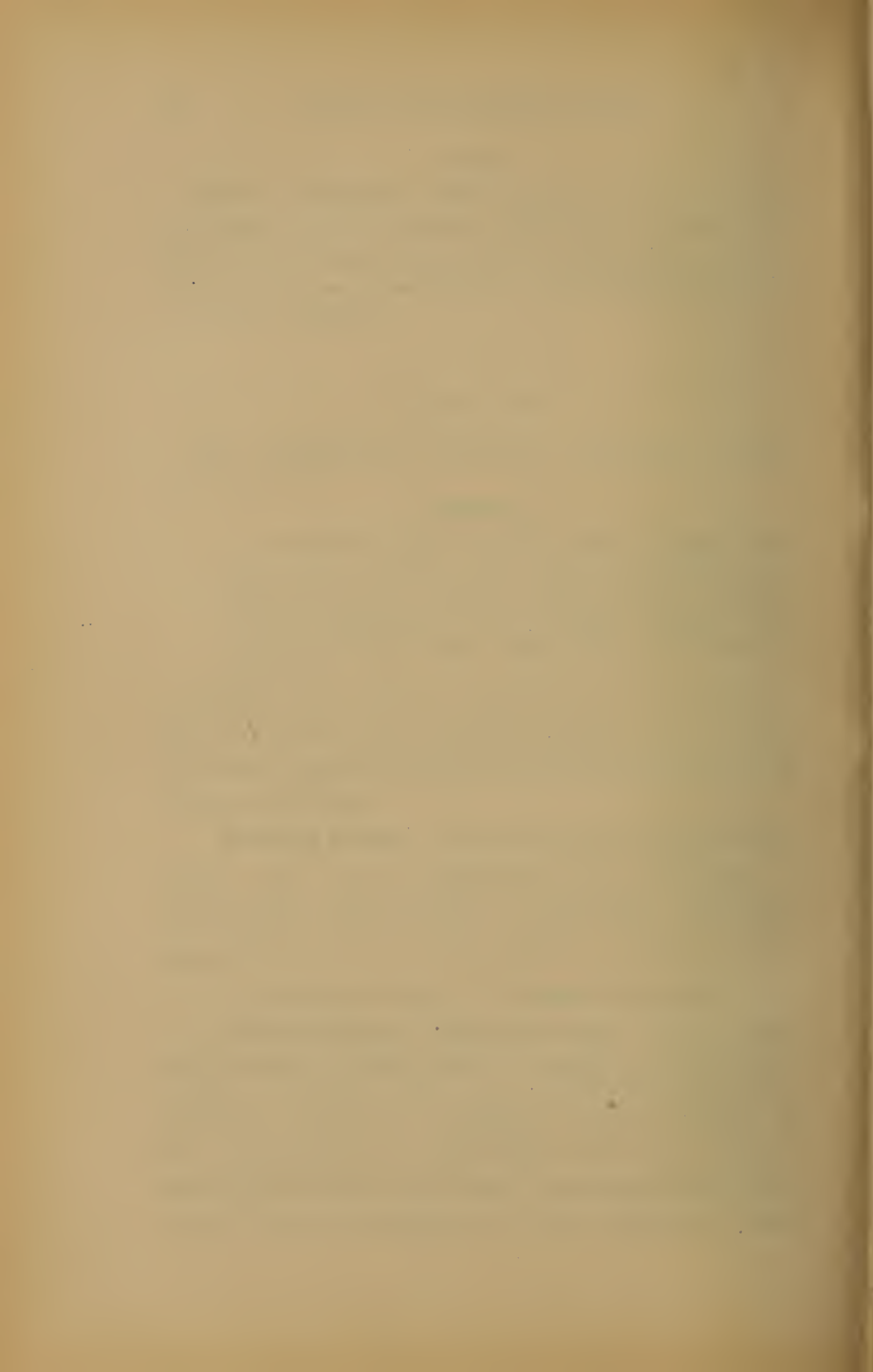
In general its action is chiefly that of a local astringent, to increase the oxygen-carrying power of the red blood corpuscles, and to convert the oxygen in the tissues into ozone.

1. **External Action.** No action on the unbroken skin. Ferric and ferrous preparations are astringent to broken skin and to mucous membranes, coagulating the albumin, and by this property acting as hemostatics.

*Antagonists*—Irritants. *Synergists*—Astringents.

2. **Internal Action.—Digestive Tract.** In the mouth they produce a styptic taste. Astringent preparations pucker the mouth. The tongue and teeth are blackened (formation of ferrous sulphide). In the stomach all iron preparations are converted into ferric chloride. Strongly acid salts may irritate the stomach (liberation of free acid and formation of ferric chloride). Small





doses by stimulation and astringent properties act as stomachic tonics. In the intestines iron is converted into alkaline albuminate and other soluble salts, and into insoluble sulphide and tannate, in which forms they are excreted, blackening the feces. Astringent preparations constipate.

*Antagonists*—Laxatives. *Synergists*—Astringents.

3. **Circulation.** On entering the blood, the iron combines with the red blood cells, increasing their oxygen-carrying power. The hemoglobin is increased, and probably the number of red blood cells also. In the tissues iron converts oxygen into ozone. It slightly stimulates the cardiac force, and raises arterial tension.

4. **Nervous System.** Is improved by the better condition of the blood.

5. **Respiration.** Is improved by the better condition of the blood.

6. **Temperature.** Is somewhat raised by the better oxidation caused in the body.

7. **Absorption and Elimination.** The chloride in the stomach and the albuminate in the intestines are absorbed in small amounts. Organic preparations are absorbed. Some claim that no inorganic preparations are absorbed, and explain the benefits, clinically demonstrable, by the supposition that their presence prevents decomposition in the intestines of the organic iron of the food, which is then entirely absorbed. Elimination is chiefly by the intestines. A very small amount is eliminated by the kidneys, slightly stimulating their function.

**Untoward Symptoms.** Headache, impaired digestion, nausea, constipation, acne, hemorrhage, plethora.

**Poisoning.** Symptoms. Like those of other irritant poisons.

**Treatment.** Emetics, tannic acid, alkaline solutions, demulcent drinks, etc.

**Administration.** Always give after meals unless local effects on the stomach are desired. Give acid preparations through a tube to protect the teeth. Strong preparations should be well diluted. Administer three times daily in small doses. The drug is not to be used in plethoric individuals.

**Therapeutics.** Relaxed condition of the pharynx and larynx, diphtheria, chronic ulcers, epistaxis (1); anemia, chlorosis, scrofula, syphilis, nephritis, jaundice, chorea, neuralgias, certain chronic nervous diseases, incontinence of the urine, seminal emissions, erysipelas, septicemia, diphtheria, amenorrhea, menorrhagia (3); chronic diarrhea, chronic dysentery, intestinal hemorrhage (2); hemorrhage of the kidneys, bladder, etc. (7).

**Contra Indications.** Acute inflammatory conditions and fevers, anemia due to malignant disease, hemorrhagic diathesis.

#### MANGANESE.

*Incompatibles*—Salts of lead, silver and mercury.

**External Action.** Potassium permanganate when moist gives up oxygen in the presence of organic substances. It is therefore an antiseptic and disinfectant.

**Internal Action.** Manganese salts are gastrointestinal irritants in large doses. In small doses they promote digestion. Large or long continued doses cause muscular and cardiac weakness and fatty degeneration. The drug is very slightly absorbed into the blood, and does not replace iron in therapeutics, as the red blood corpuscles do not incorporate it. The dioxide given in large doses is an efficient emmenagogue. The sulphate is a cholagogue purgative, but is unsafe.







**Therapeutics.** The dioxide in amenorrhea and dysmenorrhea, gastralgia, ulcer of the stomach, associated with iron in chlorosis and anemia.

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## EXPECTORANTS.

**Depressant.** Alkalies, antimony and potassium tartrate, apomorphine, ipecac, lobelia, pilocarpus, potassium iodide.

**Stimulant.** Acids, ammonium carbonate and chloride, balsams of peru and tolu, benzoin and benzoic acid, copaiba, cubeba, glycyrrhiza, senega, squill, tar, terebene, turpin hydrate, turpentine.

## TEREBINTHINA.

*Incompatibles*—Bromine, iodine, nitric and sulphuric acids.

**1. External Action.** Antiseptic. On skin it produces reddening, tingling, blistering, and may be absorbed from the broken skin and produce systemic effects. May cause erythematous rash and desquamation. The fumes inhaled will produce irritation of the air passages.

*Antagonists*—Emollients. *Synergists*—Irritants.

**2. Internal Action.—Digestive Tract.** In the mouth the drug produces a sensation of warmth with reflex salivation. In the stomach the drug stimulates the gastric mucous membrane and the local circulation, thus increasing absorption. Large doses cause vomiting, purging and tenesmus.

*Antagonists*—Bismuth, astringents, etc. *Synergists*—Volatile oils, etc.

**3. Circulation.** The heart and vasomotor center are first stimulated, force and tension being increased. Large doses depress by local action on the blood ves-

sels. The drug acts as a hemostatic, causing contraction.

*Antagonists*—Aconite, etc. *Synergists*—Volatile oils, alcohol, etc.

4. **Nervous System.** The drug is a stimulant to the brain and spinal cord. Large doses depress, causing delirium or stupor, impaired coördination, lessened muscular power, dilated pupils. Death by paralysis of respiration.

*Antagonists*—Bromides, chloral, etc. *Synergists*—Caffeine, coca, strychnine, etc.

5. **Respiration.** Stimulated by small dose; depressed by large.

6. **Temperature.** The drug is mildly antipyretic.

7. **Absorption and Elimination.** The drug is rapidly diffused and is rapidly eliminated by the kidneys, lungs, bowels and skin. It stimulates the organs of elimination, imparting its odor to the breath and a violent odor to the urine.

**Untoward Action.** Skin eruptions, strangury, dizziness, drowsiness, irritation of the mouth and stomach.

**Poisoning.** Symptoms. Great muscular weakness, abolished reflexes, violent vomiting and purging, with blood, irritation of the genito-urinary tract, bloody urine or suppression, skin moist, face flushed, slow, labored breathing, dilated pupils, depressed circulation, mental excitement or insensibility. Death due to cardiac failure.

**Treatment.** Empty the stomach, demulcent drinks, opium for pain, cardiac and respiratory stimulants.

**Administration.** Give on sugar or in capsules or milk. Watch for effect on the kidneys, shown first by "smoky urine." As an enema, use with some demulcent, and give every six hours or oftener. Stupes.

**Therapeutics.** Lumbago, neuralgia, myalgia, rheu-





matism, bronchitis, pleurisy, chronic inflammations, tympanitis, peritonitis, lacerated wounds, certain skin diseases (1); excessive bronchial secretion, capillary oozing, diphtheria (1, 3); flatulence, typhoid fever, tympanitis, chronic intestinal catarrh (2); intestinal hemorrhage, hemoptysis, hematemesis, menorrhagia, typhoid, pneumonia and other fevers (3); bronchorrhea, chronic bronchitis, gleet, sub-acute gonorrhea, etc. (7); tape-worm and phosphorus poisoning.

**Contra Indications.** Acute inflammation of the gastro-intestinal and genito-urinary tracts.

#### TEREBENE.

1. **External Action.** It is antiseptic, stimulant and astringent to the skin.

2. **Internal Action.—Digestive Tract.** Small doses stimulate the secretions of the stomach and intestines, large doses irritate.

3. **Elimination.** By the bronchial mucous membrane, kidneys and skin, exerting its astringent and antiseptic action.

**Therapeutics.** As an antiseptic to wounds, ulcers, etc. (1); chronic bronchitis, bronchorrhea, emphysema, genito-urinary diseases (3); flatulent dyspepsia (2).

**Administration.** Give in emulsion, capsules or on sugar.

#### TURPIN HYDRATE.

Like turpentine, it is stimulant and antiseptic to bronchial mucous membrane in excretion.

#### BALSAM PERU AND BALSAM TOLU.

*Incompatibles*—Aqueous preparations.

They are antiseptic and stimulating to raw surfaces, and to the skin. Elimination is by all avenues, exerting its action in the course of excretion.

**BENZOIN AND BENZOIC ACID.**

*Incompatibles*—Benzoic acid with alkaline salts, ammonium benzoate with ferric salts.

1. **External Action.** If concentrated, it is irritant to the skin, and to mucous membranes. It is a powerful antiseptic.

2. **Internal Action.—Digestive Tract.** It is stimulant in small doses, and irritant in large. The liver is stimulated by sodium benzoate.

3. **Circulation.** It is stimulant in large dose.

4. **Respiration.** Powerful stimulant in moderate doses.

5. **Temperature.** The drug is mildly antipyretic.

6. **Elimination.** By the kidneys, skin, salivary glands and bronchial mucous membrane, stimulating their function. It renders the urine acid.

**Untoward Action.** Besides irritation of mucous membranes, under large doses the drug sometimes causes urticaria.

**Therapeutics.** Cutaneous wounds, chapped hands, frost bite, cracked nipples, catarrhal affections of the larynx and pharynx. By inhalation for hoarseness, chronic bronchitis. Locally on ulcers, specific sores, chancroids, chancres (1); cystitis, pyelitis, incontinence due to alkalinity (6).

**Administration.** Benzoic acid in pills or in capsules. Benzoates in aromatic waters or pills. Benzoin by inhalation with steam.

**PIX LIQUIDA.**

1. **External Action.** Stimulant, antiseptic, astringent; prolonged use may cause papular eruption.

2. **Internal Action.—Digestive Tract.** The drug stimulates mucous membranes generally, and if long continued will impair digestion.







3. **Circulation.** Is mildly stimulated at first, continued use will cause depression.

4. **Elimination.** It is eliminated chiefly by the lungs, stimulating the mucous membrane, in part by the kidneys.

**Untoward Action.** Excessive doses may cause headache, gastric pain, nausea and vomiting, also smoky urine.

**Therapeutics.** Diseases of the skin, ulcers, cracked nipples, pruritus, diseases of the nose and throat (1); chronic bronchitis, advanced acute bronchitis, gleet, vesical catarrh, leucorrhea (4).

**Administration.** It is given in milk, beer, or in pill form. Syrup, wine and tar water are the most palatable.

#### SENEGA.

1. **External Action.** It is irritant to the skin, and to mucous membranes. Inhalation of the dry powder will cause sneezing, cough and increased bronchial and nasal flow.

*Antagonists*—Emollients. *Synergists*—Irritants.

2. **Internal Action.—Digestive Tract.** Small doses stimulate, large doses irritate.

*Antagonists*—Bismuth, etc. *Synergists*—Irritants.

3. **Circulation.** It is stimulated, the drug acting somewhat like digitalis, but much less powerfully.

4. **Respiration.** Is affected only in elimination.

5. **Elimination.** By the bronchial mucous membrane, increasing secretions and reflexly the cough, and by the kidneys and the skin, being diuretic and diaphoretic.

*Antagonists*—Belladonna, opium.

**Untoward Action.** Irritation of the alimentary tract.

**Therapeutics.** Sub-acute bronchitis, bronchorrhea,

chronic bronchitis, with profuse expectoration, catarrh, laryngitis (5); amenorrhea (3).

**Contra Indications.** Acute bronchitis, irritation of the gastro-intestinal tract.

**Administration.** Any of the preparations.

### EUCALYPTUS.

*Incompatibles*—Mineral acids and salts, alkalies.

1. **External Action.** It is antiseptic and irritant, and is rubifacient, vesicant and pustulant if confined.

*Antagonists*—Emollients. *Synergists*—Irritants.

2. **Internal Action.** Mild doses stimulate glands and peristalsis, large doses may cause vomiting and purging.

*Antagonists*—Belladonna, opium, bismuth. *Synergists*—Strychnine, physostigma, bitters.

3. **Circulation.** Force and frequency of the heart's action is increased by moderate doses.

4. **Nervous System.** Small doses stimulate the cerebrum. Large doses may cause somnolence or insomnia. Larger doses depress the brain, cord and medulla, abolishing reflexes, and causing loss of sensation in the lower limbs.

5. **Respiration.** Small doses stimulate, large doses depress and paralyze.

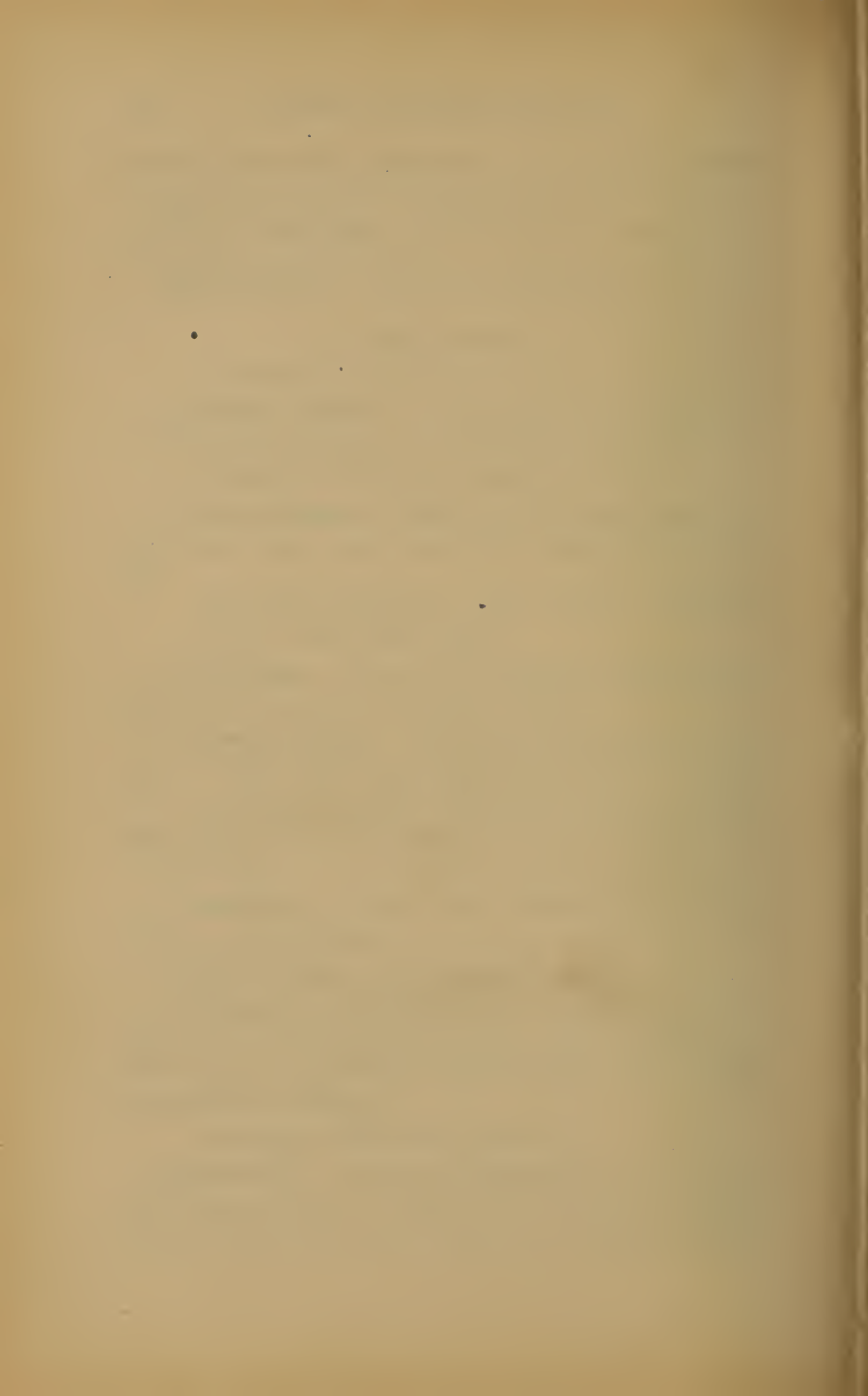
6. **Special Action.** Antimalarial.

7. **Absorption and Elimination.** The drug is rapidly absorbed, and is eliminated by the kidneys, lungs, skin and bowels, stimulating their function, and exerting its antiseptic influence.

*Antagonists*—Belladonna, opium, etc.

**Therapeutics.** Chronic inflammation of mucous membranes (2, 7); certain skin diseases, sluggish wounds and ulcers (1); fermentative diarrhea, typhoid





fever (2); chronic malaria (6); genito-urinary anti-septic (7); bronchorrhea, pulmonary gangrene, fetid bronchitis (7).

#### GLYCYRRHIZA.

The drug is demulcent, stimulates salivary flow, and acts as a laxative. Elimination is by the bronchial mucous membrane, increasing its secretions.

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#### DIURETICS.

By affecting arterial tension, cardiac stimulants, nitrites.

Acting locally on the kidneys, scoparius, buchu, juniper, turpentine, copaiba, cantharides, caffeine, diuretin, calomel, potassium acetate, citrate and nitrate, sodium citrate.

Copaiba, cubeba, oleum santali, buchu, juniper. These drugs have in general the action of the volatile oils, their effects being pronounced stimulation and disinfection of the urinary tract. Copaiba has a nauseous, bitter taste, and produces eruptions and anorexia. The urine will give the reaction of albumin with nitric acid, but the cloud disappears under heat or alcohol.

**Untoward Action.** This class of drugs may produce skin eruptions and gastro-intestinal irritation. Too long continued, or in too great quantity, they may cause severe renal irritation, producing scanty albuminous urine, casts desquamative nephritis. Juniper is not diuretic in health.

**Poisoning.** Symptoms and treatment like turpentine. ["Volatile Oils," Class IV.]

#### DIURETIN.

*Incompatibles*—Acids.

**Internal Action.**—**Digestive Tract.** It sometimes causes nausea and vomiting.

**Circulation.** Arterial tension is raised by stimulation of the vasomotor center.

*Antagonists*—Cardiac and vasomotor depressants.

**Nervous System.** Large doses may cause headache, insomnia, etc.

**Absorption and Elimination.** It is quite rapidly absorbed, and is eliminated by the kidneys, stimulating the renal epithelium. The drug seems to have no effect in health on the urine.

*Synergists*—Diuretics.

**Untoward Action.** Irritation of the gastro-intestinal tract, somnolence, headache, ringing in the ears, eruptions.

**Administration.** It should be given in capsules or in solution, but never in powders. It is best to begin with moderate dose, and then increase. Give between meals to avoid the action of the gastric juice. As much as 100 to 150 grains may be given in twenty-four hours.

**Therapeutics.** To remove accumulation of fluid in the tissues or cavities (digitalis, squill, scoparius, diuretin, copaiba); to remove waste products from the blood (alkaline diuretics, turpentine, juniper, etc.); to prevent or dissolve urinary concretions (lithium salts, piperazine). The volatile oil series of this class of drugs are used in chronic bronchitis.

**Contra Indications.** Acute inflammation of the gastro-intestinal or genito-urinary tracts.

#### PIPERAZIN.

*Incompatibles*—Alkaloids, tannic acid, cinchona, iron, alum, Donovan's solution, acetanilid, phanacetin, sodium salicylate.

Its only action is to dissolve uric acid, forming with it a very soluble salt. It does not increase the quantity







of urine, but increases urea, and decreases uric acid. Large doses may cause nervousness, hallucinations and spasms. It is not irritant to mucous membranes.

*Synergist*—Lithium.

**Administration.** In solution in water or in aerated water.

**Therapeutics.** Locally to gouty joints, vesical catarrh. Internally in gout, uric acid calculi, chronic cystitis, renal colic.

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## DIAPHORETICS.

Pilocarpus, solution of ammonium acetate, sweet spirits of nitre, Dover's powder.

### PILOCARPUS.

*Incompatibles*—Tannic acid, caustic alkalies, metallic salts.

1. **Internal Action.** It stimulates the flow of salivary and gastric glands, and increases peristalsis. Large doses will cause nausea and vomiting.

*Antagonists*—Belladonna, opium. *Synergists*—Bitters, strychnine, etc.

2. **Nervous System.** No effect by medicinal doses other than stimulating the nerve terminals of the involuntary muscles.

*Antagonist*—Belladonna. *Synergist*—Ergot.

3. **Circulation.** Cutaneous vessels are dilated. Action is at first stimulated, and then depressed.

*Antagonist*—Belladonna. *Synergist*—Opium.

4. **Temperature** is considerably lowered.

5. **Eye.** Pupils are contracted by stimulation of the oculo-motor nerve, and intra-ocular tension is increased.

*Antagonist*—Belladonna.

**6. Absorption and Elimination.** Both rapid. It is eliminated by the kidneys, increasing the urine if the dose is small. The elimination of urea is largely increased. Also by the skin, stimulating the sweat glands and their nerves. Later it causes vasomotor palsy, sweat is tremendously stimulated, being at first acid, then neutral and then alkaline. Lachrymal and mammary secretions are also stimulated.

*Antagonists*—Belladonna, opium. *Synergists*—Diaphoretics, diuretics.

**Untoward Action.** Pain, nausea, vomiting, headache, pain in the urethra and in the lumbar region, vertigo, dim vision and stupor.

**Poisoning.** Symptoms. Like untoward action with diarrhea, profuse depressing sweat, collapse.

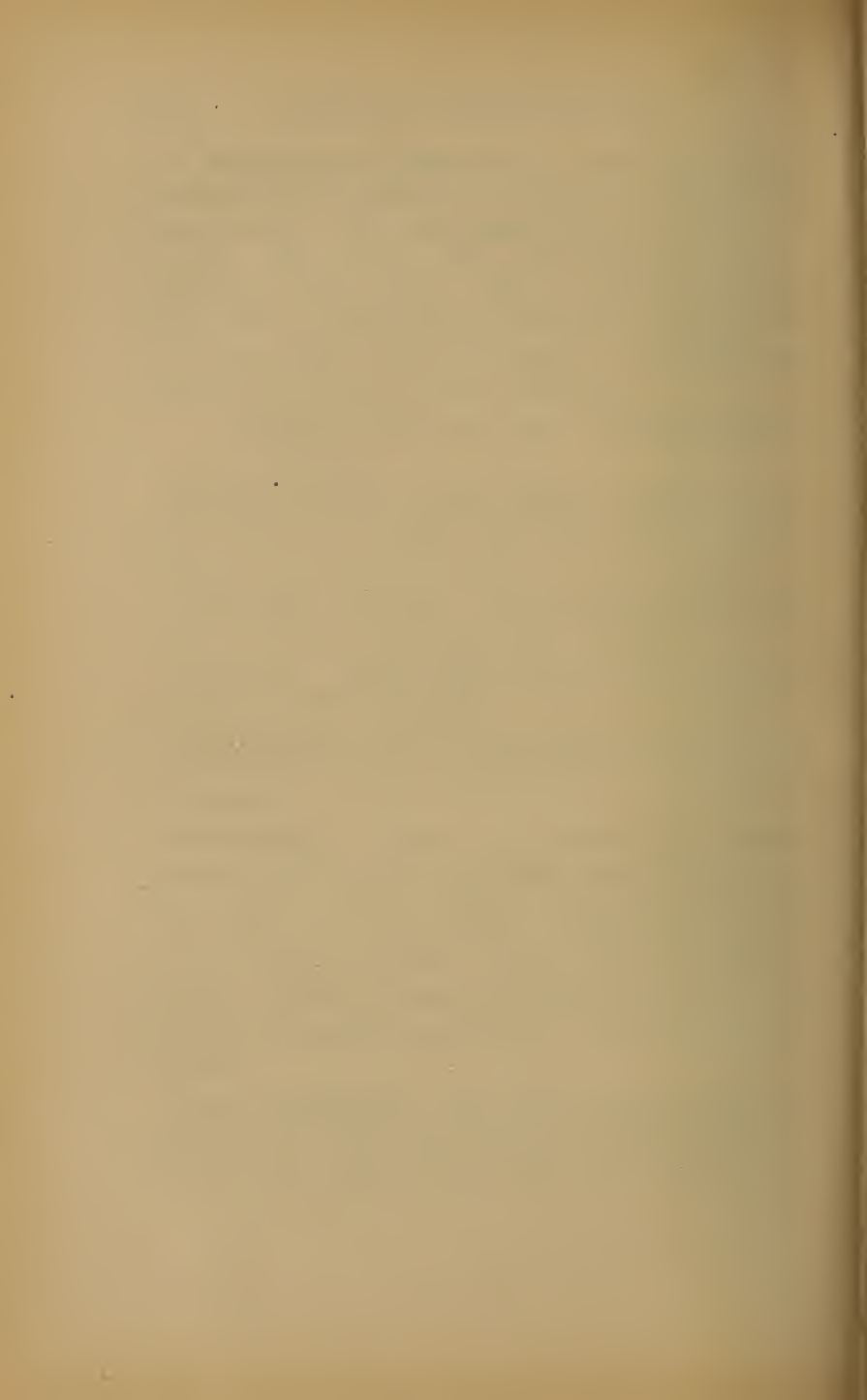
**Treatment.** Tannic acid, stomach pump, atropine, morphine, cardiac stimulants.

**Administration.** It is best given hypodermically, but may be given in elixir, or preparations of jaborandi by the rectum.

**Therapeutics.** Dryness of the throat (1); certain diseases of the eye (5); nephritis, renal dropsy, pleuritic effusion, uremic poisoning, erysipelas, malarial paroxysms (2); humid asthma, bronchorrhea, sweating of phthisis, ptyalism, mumps, adenitis, diabetes insipidus, chronic diseases of the skin, colds, catarrhal jaundice, belladonna poisoning (6); as a galactagogue, alopecia.

**Contra Indications.** Weak heart, atrophy and fatty degeneration of the heart and blood vessels, tendency to pulmonary congestion and edema, asthenic fevers.





**SPIRITUS AETHERIS NITROSI.**

*Incompatibles*—Potassium iodide, ferric sulphate, anti-pyrin, acacia, tincture of guaiac, tannic and gallic acids.

**Action.** It is a diffusible stimulant, stomachic, carminative and nerve sedative. It is diuretic or diaphoretic, according to the manner of administration. If the patient is kept cool, the diuretic action will be dominant. Given with warm water, the patient being well covered, it will produce diaphoresis.

**Administration.** As an antipyretic or diaphoretic give twenty to thirty minims every half hour. For diuresis, one-half to one drachm, with some other diuretic. Care should be taken that a reliable preparation is used.

**Therapeutics.** Febrile affections, nephritis, congested kidneys, painful affections of the urinary tract, flatulent dyspepsia, nausea, nervous agitation, dysmenorrhea. Locally in neuralgic headache.

**LIQUOR AMMONII ACETATIS. (Spirit of Mindererus.)**

*Incompatibles*—Metallic sulphates, salts of lead and silver, lime water, carbonates of potassium and sodium, acids.

**Action.** Stimulant to circulation, diuretic or diaphoretic, according to the manner of administration, like sweet spirits of nitre.

**Administration.** The preparation should be freshly made and well diluted with sweetened water.

**Therapeutics.** Febrile conditions as acute coryza, influenza, etc. Muscular rheumatism, eruptive fevers, scarlatinous dropsy, migraine, acute alcoholism, dysmenorrhea. Locally in glandular swellings, contusions, incipient abscesses, etc.

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**EMMENAGOGUES AND OXYTOCICS.**

**Direct.** Ergot, digitalis, sabina, ruta, quinine, asafetida, guaiacum, borax, cantharides.

**Indirect.** Hematics, strychnine, cinnamon, aloes.

**SABINA.**

1. **External Action.** On the skin the drug is an irritant, and may produce vesication like turpentine.

*Antagonists*—Emollients. *Synergists*—Irritants.

2. **Internal Action.—Digestive Tract.** It is irritant to the stomach.

3. **Circulation.** The heart is stimulated, and the circulation is increased, especially that of the genital organs, which renders the drug emmenagogue, and in very large doses abortifacient.

*Antagonist*—Viburnum. *Synergists*—Ergot, quinine, etc.

4. **Absorption and Elimination.** It is eliminated by the skin, kidneys, lungs and bronchi, stimulating their secretions.

**Untoward Action.** Large doses cause gastro-enteritis, suppression of urine and unconsciousness.

**RUTA. (Rue.)**

In its action and uses like sabina.

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**UTERINE DEPRESSANTS.****VIRBURNUM PRUNIFOLIUM.**

*Incompatibles*—Like tannic acid.

This drug is astringent and antispasmodic.

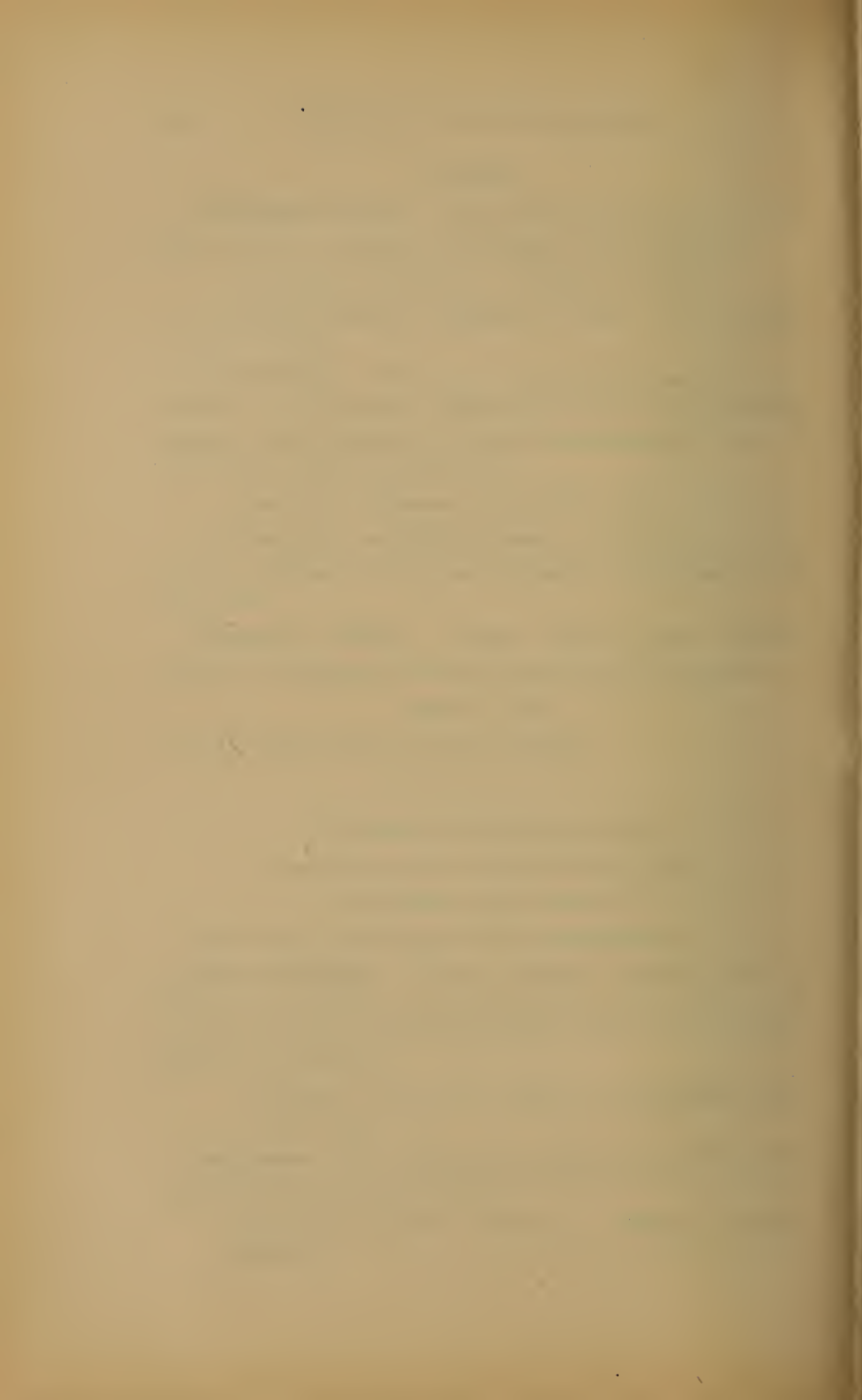
**Nervous System.** On the nervous system it has no effect on sensibility or consciousness. It is depressant to motor centers, lowering reflexes, and it may produce paresis or paralysis.

*Antagonists*—Strychnine, caffeine, etc. *Synergists*—Chloral, physostigma, etc.

**Circulation.** It is reduced by depression of the heart muscle and vasomotor center.

*Antagonists*—Cardiac stimulants. *Synergists*—Cardiac depressants.







**Uterus.** Spasms of the uterus are reduced, and the drug is an antiabortifacient.

**Therapeutics.** Spasmodic and membranous dysmenorrhea, menorrhagia of the menopause, prevention of abortion, after pains.

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### RUBEFACIENTS.

Ammonia, alcohol, camphor, capsicum, chloroform, ether, iodine, menthol, mustard, oil of cajuput, oil of turpentine, volatile oils.

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### VESICANTS AND PUSTULANTS.

**Vesicants.** Glacial acetic acid, ammonia, cantharides, iodine, mustard.

**Pustulants.** Croton oil, tartar emetic, silver nitrate, ipecac.

### CANTHARIDES.

1. **External Action.** The drug may be absorbed from the skin, and is a rubifacient, and a slow, but powerful vesicant. It produces reflex stimulation of the blood vessels of underlying organs.

2. **Internal Action.** In the stomach it is irritant, and may cause gastro-enteritis.

3. **Circulation.** Moderate doses stimulate, increasing the force and rate of the heart and raising arterial tension. Large doses depress. In moderate doses, by increasing the blood supply to the genital organs, it is emmenagogue.

4. **Nervous System.** Moderate doses produce no effect. Excessive doses may cause convulsions and coma.

5. **Absorption and Elimination.** The drug is rapidly absorbed, and is eliminated by the kidneys, stimulating its cells, and at first increasing the urine. It is

very apt to cause inflammation of the kidney and urinary tract. The increased circulation and irritation of the genito-urinary tract render the drug aphrodisiac.

**Poisoning.** Symptoms. Toxic doses may produce abortion, and cause gastro-enteritis, strangury, priapism, hematuria, and swollen genitals.

**Treatment.** Demulcent drinks, stimulants, opium. Avoid fats and oils, as they dissolve the active principle of the drug.

**Administration.** For vesication the drug requires from six to eight hours' application. After formation of the blister the epidermis should be clipped away, and surgical dressings applied to the raw surface. The drug is rarely used internally, and when so used the tincture is the best preparation.

**Therapeutics.** Pneumonia, pleurisy and other deep-seated inflammations, boils, pericarditis, neuralgia, sciatica, subacute and chronic meningitis, synovitis, periostitis, ovaritis, otitis media, alopecia (1); incontinence of the urine, pyelitis, catarrh of the bladder, diabetes insipidus, gleet, prostaticorrhea, spermatorrhea, impotence (5).

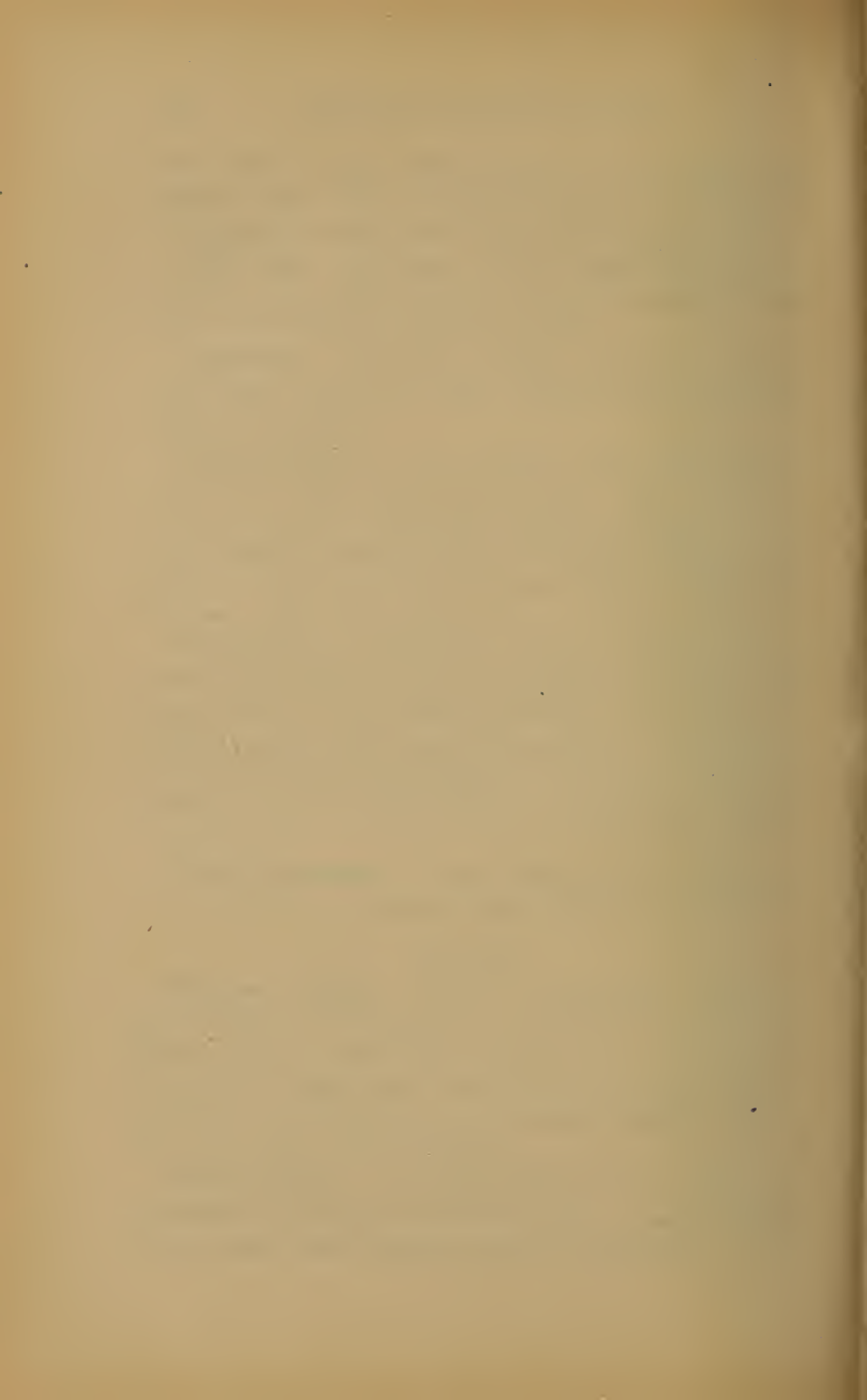
**Contra Indications.** Acute inflammation of the gastro-intestinal and genito-urinary tracts.

#### SINAPIS.

**External Action.** Irritant, rubefacient, vesicant. Any degree of irritation from redness to blistering. More rapid in action than cantharides. It produces warmth, burning pain, then loss of sensation. The irritation of cutaneous nerve terminals reflexly stimulates the heart and respiration.

**Internal Action.** In small amount it is a powerful stimulant to the gastro-intestinal tract. Large doses irritate and cause emesis without depression.





**Administration.** A plaster made of equal parts of flour and mustard mixed with water to the consistency of a thick paste, spread on cloth and covered with dampened gauze. A milder application is prepared by making a corn-meal or flax-seed poultice, to which a small quantity of mustard (say, one-sixteenth part) is added. As an emetic, one to three drachms in a pint of warm water.

**Therapeutics.** For counter-irritation, to stimulate circulation and respiration in syncope and coma, as a bath (one drachm in one gallon of water) in colds, measles, scarlet fever, as a Sitz bath in suppressed menses.

## CAUSTICS.

Arsenious acid, carbolic acid, liquor potassae, liquor sodae, glacial acetic acid, mineral acids, burnt alum, copper sulphate, mercuric chloride, nitrate, and oxide, silver nitrate, zinc chloride and sulphate.

## ASTRINGENTS.

**Vegetable.** Tannic and gallic acids, catechu, kino, krameria, hematoxylon, witch hazel.

**Mineral.** Lead, zinc, copper, silver, alum, bismuth, cerium oxalate.

### ACIDUM TANNICUM.

*Incompatibles*—Salts of iron, lead, silver, antimony and copper, alkaloids, glucosides, gelatine, alkalies, mineral acids, emulsions.

1. **External Action.** It has no effect on the unbroken skin. On the broken skin or on mucous membranes it is a powerful astringent, contracting tissues and coagulating albumin.

*Antagonists*—Irritants.

2. **Internal Action.—Digestive Tract.** It puckers and dries the mouth (coagulation of albumin), and diminishes the sense of taste. Large doses may cause vomiting. In the stomach pepsin is precipitated, albumin is coagulated, and the gastric secretion is lessened. In the intestines the drug is partially converted into gallic acid, and is thus absorbed, exerting its astringent action, lessening peristalsis, and tending to constipate.

*Antagonists*—Strychnine, bitters, cathartics. *Synergists*—Opium, belladonna, etc.

3. **Circulation.** By its astringent power it is hemostatic, contracting blood vessels. Absorbed into the blood as gallic acid, and does not act on the blood.

4. **Absorption and Elimination.** It is absorbed as gallic acid, and is thus eliminated by the kidneys.

**Untoward Action.** Pain in the stomach and intestines, coated tongue, eructations, thirst, hemorrhoidal congestion, tenesmus.

**Therapeutics.** Bed sores, ulcers, sore nipples, numerous skin diseases, hyperidrosis, erysipelas, certain diseases of the ear, nose and throat, ulcerous gums, stomatitis, whooping-cough, hemorrhoids, rectal ulcer, fissure and prolapse, leucorrhea, inflammation of the cervix, cancer of the uterus, gonorrhea, hemoptysis, acute dysentery (by enema) (1); intestinal hemorrhage, diarrhea (2); alkaloidal poisons.

**Administration.** Locally in any form. Internally for intestinal effects in pills. For hematemesis in powders. Avoid use with iron.

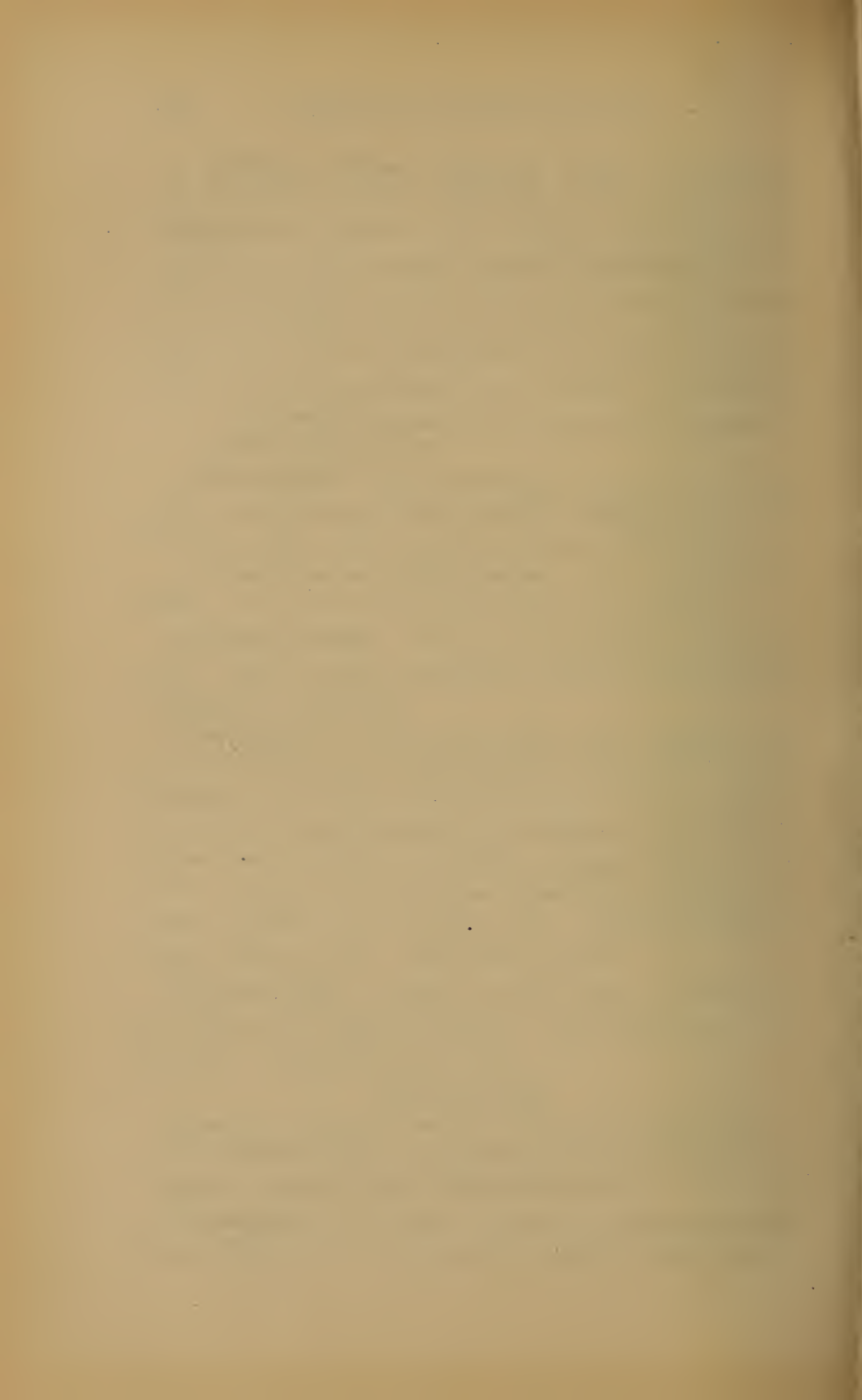
#### GALLIC ACID.

*Incompatibles*—Spirit of nitrous ether and like tannic acid.

It is like tannic acid, except that it does not coagulate albumin, and is far more readily absorbed.

**Therapeutics.** It is not so good as tannic acid for local effects, but is better for general effects after







absorption. Hemorrhage of any of the internal organs, excessive sweating, bronchorrhea, cystitis, dysentery and chronic diarrhea, pyelitis.

**Administration.** It is given as either pill or powder. Avoid use with iron.

**CATECHU.**

**Physiological Action.** Like tannic acid, and is more energetic than kino.

**Therapeutics.** Like tannic acid.

**Administration.** Give the troches in pharyngitis, the compound tincture in diarrhea.

**KINO.**

**Physiological Action.** Like tannic acid.

**Therapeutics.** Like tannic acid, it acts quickly, and is less irritant than tannic acid.

**Administration.** Use the powder locally, the tincture internally.

**KRAMERIA.**

**Physiological Action.** Like tannic acid.

**Therapeutics.** Like tannic acid, and is often used in tooth powders.

**Administration.** The powder is given by insufflation, for fissure of the anus the aqueous solution of the extract.

**HAMAMELIS.**

**Physiological Action.** Like tannic acid.

**Therapeutics.** Like tannic acid.

**Administration.** The distilled extract is the best preparation.

**HAEMATOTOXYLON.**

**Physiological Action.** Like tannic acid.

**Therapeutics.** Like tannic acid. It renders the stools and the urine red.

**Administration.** The decoction is the best preparation.

**ALUMEN.**

*Incompatibles*—Alkalies and their carbonates, salts of iron, lead and mercury, tartrates and tannic acid.

1. **External Action.** On the unbroken skin it thickens and hardens it. On the denuded skin or mucous membranes it coagulates the albumin and contracts the small blood vessels.

*Antagonists*—Irritants.

2. **Internal Action.—Digestive Tract.** It first stimulates the salivary flow, and then diminishes it by its astringent effect, blanching and puckering the tongue, and it may injure the enamel of the teeth. It diminishes the amount of gastric juice, and precipitates pepsin. Excessive dose may cause vomiting, purgation and pain.

*Antagonists*—Bitters, strychnine, cathartics. *Synergists*—Opium, belladonna, etc.

3. **Circulation.** It is absorbed by the blood vessels, contracting them, hence it lessens all secretions and checks hemorrhage.

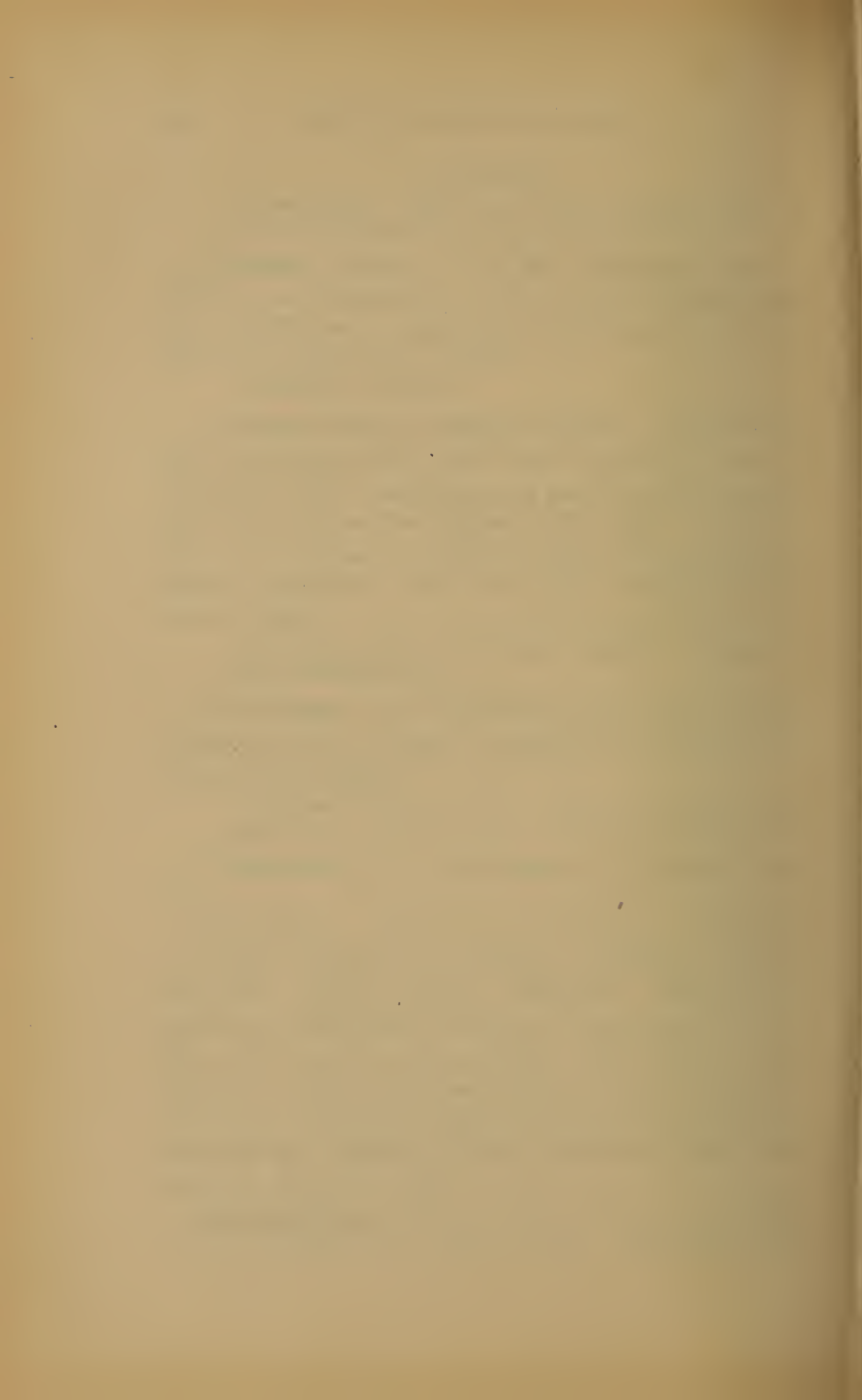
*Antagonists*—Mercury, etc. *Synergists*—Opium, belladonna, etc.

4. **Elimination.** It is eliminated by the kidneys and liver.

**Therapeutics.** Exuberant granulations, epistaxis, superficial bleeding, sore throat, tonsillitis, ulcerous stomatitis, swollen gums, salivation, conjunctivitis, trachoma, with milk for "black eye," gonorrhea, leucorrhea, gleet, pruritus, hyperidrosis, ingrowing toe nail, ulcers, as a spray in bronchorrhea, chronic laryngitis, bronchitis, whooping-cough (1); internal hemorrhage, polyuria (3); diarrhea, chronic dysentery, atonic constipation, lead colic (2).

**Administration.** As an emetic, one to two drachms in syrup followed by warm water. Internally it is





given in solution in syrup. Externally, dried alum, powdered alum or the aqueous solution is used.

### BISMUTH.

1. **External Action.** On the unbroken skin it is simply protective. On the broken skin or mucous membranes it is mildly astringent and antiseptic.

2. **Internal Action.—Digestive Tract.** It coats the mucous membranes, acting as a sedative and mild astringent, tongue and stools are darkened, and it tends to produce constipation. It is very slowly absorbed.

*Antagonists*—Cathartics, irritants.

3. **Nervous System.** It is mildly sedative to peripheral nerve endings.

4. **Elimination.** By the urine, bile and feces.

**Untoward Action.** Nausea, vomiting, pain, diarrhea, constipation, headache and dizziness.

**Poisoning.** Symptoms. Like lead. Also sloughs in the mouth and digestive tract, albuminous urine, desquamative nephritis.

**Treatment.** Lavage, demulcent drinks, freshly prepared precipitated hydrated oxide of iron.

**Therapeutics.** Various skin diseases, ulcers, chapped nipples, chapped hands, anal fissure and prolapse, burns, gonorrhea, leucorrhea, ozena, stomatitis, salivation, fetid sweating, chancres, chronic conjunctivitis (1); irritable vomiting, diarrhea, gastric ulcer, chronic dysentery, cholera infantum, alcoholic gastritis (2).

**Administration.** It is used externally as powder or ointment, internally in powder, capsules or mixtures.

### CERIUM OXALATE.

Its action is not understood, but it resembles bismuth in its action.

**Therapeutics.** Vomiting, cough of phthisis, cough of bronchitis, chorea, diarrhea.

**Administration.** In pill or powder.

**ARGENTUM NITRAS.**

*Incompatibles*—The alkalies and their carbonates, chlorides, hydrochloric and tannic acids, potassium iodide, solution of arsenic, organic acids.

1. **External Action.** Caustic, coagulates albumin, limiting the effect, eschar, at first white, but turns dark in the light, hemostatic, irritant to mucous membranes.

2. **Internal Action.—Digestive Tract.** It is changed in the stomach into peptonates and albuminates. It stimulates the intestinal glands and the flow of bile. Large doses impair digestion, astringent.

3. **Circulation.** Small doses stimulate the heart. It lessens the fibrin of the blood, and changes the hemoglobin into hematin, and also alters the shape of the red blood cells. Large doses depress the heart. (Compare mercury.)

4. **Nervous System.** It is tonic in small doses. Large doses cause convulsions and paralysis.

5. **Respiration.** Small doses are stimulant, large doses paralyze the respiratory center.

6. **Absorption and Elimination.** It is absorbed from the stomach, and is slowly eliminated by the feces, and slightly by the kidneys.

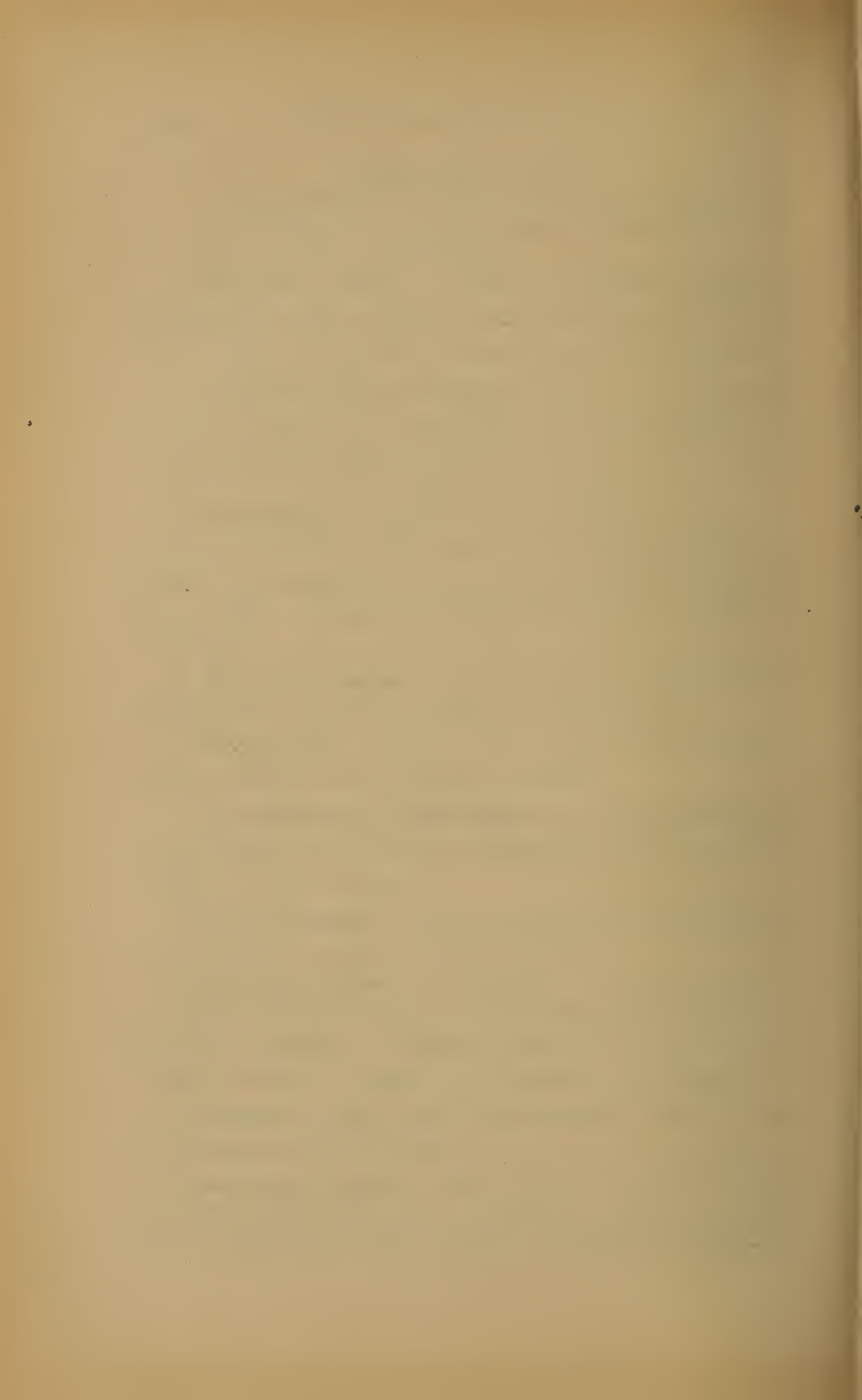
**Untoward Action.** Long continued use discolors the skin, palpitation and irregular pulse.

**Poisoning.—Acute.** Symptoms. Violent gastroenteritis, blackish vomiting resembling milk curds, convulsions, delirium, eccentric paralysis, profuse bronchial secretions. Death by respiratory paralysis.

**Treatment.** Table salt, large quantity of water, soap and water or milk, opium.

**Poisoning.—Argyria.** Slate-colored discoloration of the skin, beginning in the sclerotic conjunctiva, dark line on the inner side of the lips, ulcerative stomatitis.







**Treatment.** Potassium iodide, sodium hyposulphite, baths of hyposulphites, or potassium cyanide. The discoloration is usually permanent.

**Therapeutics.** Ophthalmia, conjunctivitis, felons, boils, bed sores, subacute gonorrhea and leucorrhea, pruritus, indolent ulcers, chancroids, small-pox eruption, orchitis and epididymis, inflammations and ulcerations of the pharynx, etc., tonsillitis, sore nipples, wounds and certain ear diseases (1); intestinal and gastric ulcer, chronic gastritis, dysentery, diarrhea (2); locomotor ataxia, epilepsy, chorea (3, 4).

**Administration.** For constitutional effects give in pill form during active digestion; for local action on the digestive tract give pill on an empty stomach. Discontinue the administration for a time after two or three weeks to prevent chronic poisoning.

#### ARGONIN.

A soluble compound of silver and casein. It is a powerful germicide. Even in strong solution it is non-irritating, and is without astringent effects.

**Therapeutics.** Gonorrhea.

#### PLUMBUM.

1. **External Action.** It has little action on the unbroken skin. On the denuded skin it contracts the blood vessels, coagulates the albumin and forms a protective coating. It is sedative to nerve terminals, and is hemostatic.

*Antagonists*—Irritants. *Synergists*—Astringents, opium, etc.

2. **Internal Action.—Digestive Tract.** It contracts the cells, vessels and mucous membrane of the entire alimentary tract, diminishing secretions and peristalsis, and hence tending to constipate. Excessive dose may act as an irritant poison.

*Antagonists*—Mercury, cathartics.

3. **Circulation.** It is absorbed as albuminate, and interferes with the nutrition of the red blood corpuscles, producing a watery condition of the blood. By irritation of the cardiac inhibitory center it slows the heart's action. The volume of the pulse is lessened.

*Antagonists*—Iron, arsenic, etc. *Synergists*—Mercury, etc.

4. **Nervous System.** Excessive doses may cause irritation of the spine, both motor and sensory, resulting in paralysis, especially of the involuntary muscles.

5. **Uterus.** It may cause abortion or still birth by the changes it produces on the blood.

6. **Absorption and Elimination.** It is converted in the stomach into the albuminate, and is so absorbed. In the intestines it is converted into insoluble sulphide. It is directly absorbed from the abraded skin. Elimination is by the bile, sweat, milk and urine. It is deposited in the tissues.

**Untoward Action.** Loss of appetite, gastric pain, constipation, colic, external use may cause discoloration of the skin.

**Poisoning.—Acute** (rare). Symptoms. Sweet metallic taste, nausea and vomiting of a white, curdy fluid, constipation, diarrhea with black stools, severe, continued abdominal pain, rigid abdominal muscles with retraction, great thirst, cramp in the calves of the legs, neuralgia pains, twitching, vertigo, stupor, anesthesia, paralysis.

**Treatment.** Empty stomach, epsom salts, opium, external heat.

**Poisoning.—Chronic.** Symptoms. Any of the above with wrist drop and paralysis of extensor muscles, colic, small liver, anorexia, coated tongue, blue line on gums, discolored mucous membranes, albuminuria, cirrhosis of kidneys, neuritis, atrophy of nerve trunks, muscular wasting.





**Treatment.** Sulphates, cholagogue purgatives, morphine, sulphuric acid lemonade, milk, potassium iodide, diaphoretics, strychnine, electricity.

**Administration.** Sub-acetate is not used on abraded surfaces. Watery solution of the acetate (two to ten grains to one ounce) for local application usually with opium or morphine. Lead acetate (three grains) with opium (one grain) in pills internally, every three to four hours. By enema in strength five grains to one ounce of water. Lead nitrate as a powder locally.

**Therapeutics.** Acute inflammatory conditions of the skin, bruises, gonorrhea, leucorrhea, gleet, hemorrhoids, orchitis, synovitis (1), internal hemorrhages, hemoptysis (2, 3), diarrheas, cholera infantum, chronic gastritis with pain (2), night sweats (6).

**Lead Subacetate.** Bruises, sprains, inflammations, itching, felons.

**Lead Iodide.** Little used. Enlarged glands, psoriasis, eczema.

**Lead Oxide.** Sweating feet.

**Lead Nitrate.** Onychia, fissured nipples, gangrenous sores, fetid discharges.

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## ANTISEPTICS.

Carbolic acid, creosote, guaiacol, salicylic acid, salol, salicin, resorcin, ichthyol, iodoform, benzoin and benzoic acid, balsam of peru, boric acid, borax, potassium permanganate, potassium chlorate, sodium hyposulphite, eucalyptus, oil of gaultheria.

### CARBOLIC ACID.

*Incompatibles*—Bromine, metallic salts, antipyrin, colloidion, alkalies, lime, soluble sulphates.

I. **External Action.** Undiluted it is caustic, produc-

ing a white scar, which soon turns brown. It coagulates the albumin, and is therefore limited in its action. In weak solutions it causes tingling and reddening of the skin. It may be absorbed from the skin. It is disinfectant and antiseptic, and also paralyzes sensory nerve terminals, producing anesthetic effect.

2. **Internal Action.—Digestive Tract.** In the stomach, in small doses, it is sedative; in large doses it is a powerful gastric irritant. It is converted in the stomach into sulpho-carbonates, and is so absorbed. Antiseptic.

*Antagonists*—Irritants. *Synergists*—Hydrocyanic acid, etc.

3. **Circulation.** Small doses have no effect. Large doses first slow and then accelerate the heart action. Poisonous doses depress and paralyze the heart and vasomotor center.

*Antagonists*—Atropine, alcohol, opium.

4. **Nervous System.** Small doses have no effect. Large doses depress the cerebrum (vertigo, stupor); the anterior cornua are first stimulated (trembling and convulsions); later depression, then abolition of reflexes.

*Antagonists*—Caffeine, strychnine, coca.

5. **Respiration.** Large doses first stimulate the vagi and the respiratory center, but later depress and paralyze.

*Antagonists*—Atropine, strychnine.

6. **Temperature.** Large doses lower the temperature in fever (lessened heat production and increased heat elimination).

7. **Eye.** Poisoning doses may cause contracted pupils (paralyzing the radiating fibers).

**Untoward Action.** Headache, vertigo, rings before







the eyes, muscular weakness, sweating and formication.

**8. Absorption and Elimination.** The drug is quickly absorbed from the gastro-intestinal tract. It is eliminated by all avenues, chiefly by the kidneys (smoky urine, green, suppressed urine) and lungs.

**Poisoning.** Is rapid. **Symptoms.** If not sudden, gastro-enteritis, abolished reflexes, shock, albuminous or bloody urine. Death by respiratory paralysis.

**Treatment.** Wash stomach, epsom salts, external heat, atropine, caffeine and opium.

**Administration.** Externally may be used in solution varying from 1:10 to 1:500. Internally may be given in pills or in capsules or well diluted.

**Therapeutics.** Surgery, burns, pruritus, chronic eczema and other skin diseases, acute and chronic inflammation of the nose and throat, toothache, chancre, lupus, gangrene, bites of animals, endometritis, ulcers of the cervix (1); fermentative and flatulent dyspepsia, dilatation of the stomach, typhoid fever, acute and chronic dysentery (2).

**Contra Indications.** Acute inflammation of the gastro-intestinal and genito-urinary tracts.

#### THE SULPHO-CARBOLATES.

These preparations are broken up in the system into carbolic acid and sulphates. They then produce the combined effect of the acid and base.

**Therapeutics.** In relaxed conditions of the throat as a gargle, acute bronchitis, nasal catarrh, gonorrhea, intestinal antiseptic in diarrhea, fermentative dyspepsia, for this zinc sulpho-carbolate is best.

**Administration.** Give sodium sulpho-carbonate in solution. Give the zinc salt in pills.

**CREOSOTE,**

*Incompatibles*—Sulphuric acid and nitric acid, silver salts.

It is like carbolic acid, except that it does not stimulate the cord so much, and in that it increases the coagulability of the blood. It is an efficient stimulant expectorant.

**Administration.** In capsules or emulsion. By gradually increasing the dose tolerance may be established.

**Therapeutics.** Locally, like carbolic acid, by inhalation in phthisis, chronic bronchitis, etc. Internally, Phthisis, chronic bronchitis.

**Contra Indications.** Like carbolic acid.

**GUAIACOL.**

It is like creosote, but is not so caustic. It may be absorbed from the unbroken skin, is antipyretic when locally applied to the skin. By its stimulant action on mucous membranes it may improve the appetite, but large doses may irritate.

**Absorption and Elimination.** The drug is rapidly absorbed, and is rapidly eliminated by the kidneys, skin, saliva, and to some extent by the lungs.

**Administration and Therapeutics.** Like creosote.

Benzosol (benzoic acid and guaiacol) and guaiacol carbonate are like guaiacol in their action.

**SALICYLIC ACID AND THE SALICYLATES.**

*Incompatibles*—Mineral acids, alkalies, metallic salts.

1. **External Action.** It is antiseptic, and also softens the epidermis. Locally applied it checks sweating. It is irritant to mucous membranes.

2. **Internal Action.** Small doses stimulate; large doses irritate. It checks fermentation.





3. **Circulation.** At first arterial tension and heart force are increased by action on the heart muscles and vasomotor center. Later it depresses circulation. It lessens the migratory movements of the white blood cells.

*Antagonists*—Cardiac stimulants. *Synergists*—Cardiac depressants.

4. **Nervous System.** Large doses may cause cerebral congestion (ringing in the ears, fullness, etc.). Reflexes are diminished by depression of the motor mechanism. It has no effect on peripheral nerves.

*Antagonists*—Caffeine, strychnine, etc. *Synergists*—Cerebral depressants.

5. **Respiration.** Small doses stimulate the vagi and respiratory center; toxic doses depress and paralyze.

6. **Temperature.** Normal temperature is unaffected, fever temperature is materially lowered.

7. **Absorption and Elimination.** The drug is converted in the stomach and intestines into sodium salicylate, and is rapidly absorbed. It is eliminated by the kidneys chiefly (greenish urine, urea and uric acid increased), also by the skin (sweating), but partly by all avenues.

**Untoward Action.** Rashes, itching, edema, sweating, ringing in the ears, motor disturbances, depression.

**Poisoning.** Symptoms. Roaring, headache, deafness, vertigo, sweating, subnormal temperature, depressed circulation and respiration, dim vision, ptosis and strabismus, involuntary feces and urine. Death by respiratory paralysis.

**Treatment.** Diffusible cardiac stimulants, diffusible respiratory stimulants, external heat, etc.

**Administration.** It is best given in solution after meals. Give bromides to prevent cerebral effects.

The salicylates are in every respect like salicylic acid, but are not so irritating.

**Therapeutics.** Erysipelas, chancroids, various skin diseases, acute coryza, stomatitis (1); acute articular rheumatism (3, 6); rheumatic chorea, herpes zoster, neuralgic headache, quinsy, lumbago, sciatica (3, 4); fermentative dyspepsia, flatulence, diarrhea, chronic gastric catarrh, chorea (2); tape and round worms, influenza.

**Contra Indications.** Weak heart, debility, acute renal inflammation.

#### SALOL.

It is composed of salicylic and carbolic acids. It is like salicylic acid, except it is not irritating to the stomach, and is more antiseptic, more analgesic and more sedative to the brain and cord.

**Administration.** Give in pills, capsules or powders.

**Therapeutics.** Antiseptic dressing to wounds, ulcers, etc. Internally acute and chronic cystitis, gonorrhea, intestinal catarrh, catarrhal jaundice, diarrhea, cholera morbus, neuritis, myalgia.

#### BORIC ACID.

*Incompatibles*—Carbonates and bi-carbonates, alkaline, earthy, and metallic bases.

1. **External Action.** It is non-irritating, antiseptic, antipruritic and exsiccant.

2. **Internal Action.—Digestive Tract.** It retards the action of the saliva, but aids gastric and pancreatic digestion. Immoderate doses check gastric digestion, and may cause gastro-intestinal irritation.

3. **Temperature.** It is mildly antipyretic.

4. **Elimination.** It is eliminated by the saliva, feces, sweat and urine, increasing the quantity of the latter,







and increasing the amount of nitrogenous waste eliminated.

**Untoward Action.** Desire to micturate, nausea, vomiting, pain, derangement of the nervous system, small, weak pulse, hiccough, cutaneous eruptions.

**Administration.** Give in capsules or in solution.

**Therapeutics.** Many diseases of the ear, nose, throat and mouth, acute conjunctivitis, leucorrhea, gonorrhea, chronic cystitis, any condition in which a mild non-irritating antiseptic is indicated (1); chronic cystitis, summer diarrhea (4).

#### BORAX.

1. **External Action.** It is like boric acid, but is less antiseptic, and less antipruritic. It is protective and sedative.

2. **Internal Action.—Digestive Tract.** It is similar to the alkalies, is refrigerant and diuretic; emmenagogue.

**Therapeutics.** It is like boric acid, epilepsy, paralysis agitans.

#### IODOFORM.

*Incompatibles*—Mercuric chloride.

1. **External Action.** It is non-irritating, checks serous oozing from wounds, and is analgesic.

2. **Internal Action.** Small doses slightly increase the alkaline secretions and the bile. Large doses irritate the stomach.

3. **Circulation.** Small doses strengthen and slow the pulse, increasing tension briefly. Full doses lessen tension and weaken force. Poisonous doses quicken and weaken the pulse, and finally paralyze the cardiac muscle.

4. **Nervous System.** Large doses may cause headache, restlessness, stupor, or delirium, reflexes are usually lessened, as is the contractility of the muscles.

**5. Absorption and Elimination.** It is slowly absorbed from the alimentary canal, readily from wounds. In the tissues it forms iodides. Elimination is by all avenues, but is chiefly by the kidneys as sodium iodate. It may accumulate in the system.

**Untoward Action.** Skin eruptions, muscular weakness, double vision, drowsiness, excitement, incoherence of speech, headache, mental confusion.

**Poisoning.** Symptoms. Extensive eruptions, gastro-enteritis, fixed pupils, intense headache, melancholia, hallucinations, delirium, mania, dizziness, mental confusion, languor, weak, feeble heart, coma, paralysis of the sphincters. Poisoning may be prompt or may be deferred.

**Treatment.** Withdrawal of the drug, stimulants, diuretics, diaphoretics, warm bath, opium, potassium bicarbonate.

**Administration.** It may be given internally in pills or in capsules. Externally as powder or ointment. Allied compounds substituting the external use of iodoform, equal or superior to it, are: Aristol, euophen, iodol, iodosyl.

**Therapeutics.** Wounds, ulcers, tuberculous joints, hemorrhoids, fistula, anal fissure, diseases of the ear, nose and throat, eye and skin, syphilitic lesions. It is rarely given internally.

#### ICHTHYOL.

*Incompatibles*—Potassium permanganate and other oxidizing agents.

**1. External Action.** It is an antiseptic, parasiticide, sedative. It is irritant in full strength, and is readily absorbed from the unbroken skin.

**2. Internal Action.—Digestive Tract.** It produces gastro-intestinal irritation in very large doses.





3. **Circulation.** It contracts the arteries, and in large doses increases the ratio of white blood cells.

**Administration.** Externally as ointment or in solution in chloroform, alcohol, or ether. Internally in capsules.

**Therapeutics.** Various skin diseases, synovial inflammations, inflammation of the female genitals, certain diseases of the ear and nose.

#### OLEUM GAULTHERIÆ.

**External Action.** It is antiseptic and stimulant.

**Internal Action.** It is identical with salicylic acid, but is less depressant to the circulation.

**Therapeutics.** Like aromatics and salicylic acid.

#### METHYL SALICYLATE.

It is identical in its action with oil of wintergreen. It is synthetically prepared.

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### ORGANO-THERAPY.

The introduction of preparations of animal organs as therapeutic agents is so comparatively recent that the physiological action is not thoroughly understood, and many effects are variously reported by different observers.

#### THYROID.

The essential action of this drug is on metabolism, increasing the destruction of the proteid substances, and therefore causing increased nitrogenous waste in the urine, more rapid oxidation of the fats, increased diuresis, whether due to the direct action on the kidneys or to the increased excretion of urea is undetermined. This leads to a rapid loss of weight. The effects on the circulation and respiration are uncer-

tainly determined. There may be no effect, or pulse rate may be increased, with a slight fall of arterial tension, and respiration may be increased. Excessive doses may cause great loss of weight, shortness of breath, weak, rapid pulse, general nervousness.

**Administration.** A quarter or half of a sheep's gland may be eaten raw daily, the glycerin extract may be used, best is the dried powdered gland given in doses of one grain three times a day, and increased until fifteen or twenty grains are taken daily, or until untoward symptoms arise.

**Therapeutics.** Myxedema, obesity, psoriasis, keloid; it may be tried in any case of disturbed nutrition, provided there is no tendency to emaciation.

**Contra Indications.** Weakened and emaciated conditions, exophthalmic goitre, diabetes mellitus.

#### SUPRA-RENAL CAPSULE.

It is so rapidly destroyed or eliminated that it has but little action when administered by the mouth. When administered by intra-venous injection its action is prompt. Locally applied (e. g., in the eye) it is a powerful constrictor of blood vessels; its chief action, however, is on the circulation, acting much like digitalis. It slows the heart by stimulation of the inhibitory center, and increases the force by stimulating the heart muscle. Arterial tension is tremendously raised by stimulation of the muscular coats of the arteries, and possibly also of the vasomotor center. It also increases pressure in the veins and pulmonary artery. The effects are prompt, but are of short duration, the preparation being destroyed in the liver or eliminated by the kidneys in from fifteen minutes to half an hour.

**Therapeutics.** Addison's disease, circulatory failure,







conjunctivitis, pannus, keratitis, etc., hay fever, nasal congestions, chronic eczema.

**Administration.** The aqueous extract is applied locally. Tablets of the capsule may be given internally in three-grain doses. The glycerin extract is also given internally in the dose of from twenty to thirty minims. Intra-venous injection is dangerous; administered hypodermically or internally the drug has but little effect.

### NUCLEIN.

This is a natural protection to the body against infection. It is provided in the phagocytes and the blood serum in the form of proteid-like substances, rich in phosphorus. This may be derived also from cell nuclei, yeast cells and certain animal tissues. Nuclein increases the number of leucocytes, especially those of the polynuclear variety, which are the most active phagocytes. It also increases the germicidal power of the blood serum.

**Administration.** Preparations which contain no phosphorus contain no nuclein. The drug is best given on an empty stomach three times a day. Good preparations are: Protonuclein, containing 1.25 per cent. of phosphorus, given in tablets or powder, in five to ten-grain doses. A special powder, containing no sugar of milk, is made for local applications. Improved nuclein solution (P. D. & Co.), containing 6 per cent. of phosphorus, may be used hypodermically (ten to sixty minims), or in drachm doses by mouth.

**Therapeutics.** Anemia, tuberculosis, malaria, typhoid, septicemia, noma, infectious processes.

**Contra Indications.** Gout.

### THE MAMMARY GLAND.

This drug has been used in sub-involution of the uterus, menorrhagia, and other diseases, also to check uterine hemorrhage. It checks bleeding, and retards the growth of uterine fibroids. Overdoses cause cardiac palpitation.

**Administration.** It is given in capsules or in tablets, five grains three to six times daily.

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### SERUM THERAPY.

The protective power of the blood against bacterial infection and its products has been well established. This natural protection is provided in two ways, by phagocytosis, the destructive power of the white cells of the blood for bacteria and other foreign substances, and by a theoretical chemical product developed in the blood serum, to which the term antitoxin has been applied, this antitoxin having the power to counteract or render inert the toxic or poisonous products of bacterial infection (toxins), which are the cause of the systemic disturbances in this class of diseases.

Experiment has shown that the blood of an animal rich in antitoxin can by injection into another animal render that animal immune to the infection for a period of time, or lessen the virulence of the disease. It has also been learned that certain animals are more susceptible, and others less susceptible to certain infectious diseases, or, in other words, that while certain animals will promptly succumb to an infection, lacking power to produce antitoxin sufficient for their protection, other animals, possessing this power in great degree, are practically immune to the infection unless it be simply overwhelming. Upon these observations is based the modern treatment of infectious diseases by serum or antitoxins.





Of the various antitoxins that have been offered, only the diphtheritic antitoxin has been established. It is prepared by inoculating flasks of bouillon with a virulent culture of the bacilli, in which the toxins are allowed to develop. The bouillon is then filtered through porcelain, which removes all the bacteria, but lets through the toxins. This toxic bouillon is injected into guinea pigs, very susceptible animals, to determine the virulence of the preparation, from two to one hundred millegrams being necessary to cause death. A horse is selected for the development of the antitoxic serum, as it is naturally immune to the disease and can furnish a large amount of serum. Ten times the fatal dose of toxin for a guinea pig is then injected into the horse's vein, which stimulates the production of antitoxin. This dosage is gradually increased until several hundred times the original dose can be given without ill effect. The serum is then drawn and tested for its protective power in guinea pigs. If one-tenth cc. of the serum is of sufficient antitoxic strength to protect a pig inoculated with ten times the minimum fatal dose of toxin, the serum is said to contain one unit of antitoxic power. To prevent the necessity of using enormous quantities of serum, which would be required in this strength for the protection of man, it is now prepared so that one cc. will contain 200, 300, or even as high as 1750 units. Care must be taken that the preparation used is fresh, as these strong preparations do not keep well.

The preparation is to be administered hypodermically with perfect asepsis, the skin and syringe being thoroughly sterilized. The strength of the preparation used will depend upon the virulence of the case. The dose is to be reckoned in units, not in cubic centimetres. For a child over two years of age the initial

dose should be 1500 to 2000 units, to be repeated in twenty-four hours if there is no improvement, and a third dose after like interval if necessary. For mild cases over two years of age or severe cases under two, 1000 units is the dose. Treatment should be begun just as soon as the diagnosis is clinically made, without waiting for bacteriological examination. A dose of 500 units is used as a preventive in those exposed to infection. The serum is harmless, and the joint pains and rash which sometimes follow its use, especially with preparations of great strength, are without danger, and soon disappear.

Antistreptococcic serum has met with some success in sepsis, especially in the puerperium and after injury. It has also been used with reported good results in infectious endocarditis, but it is not yet established as is the diphtheritic antitoxin.

The various other antitoxins may still be considered as in the experimental stage.







PREPARATIONS AND DOSAGE.

## PREPARATIONS AND DOSAGE.

	DOSAGE.	PERCENTAGE STRENGTH.	SOLUBILITY.		PAGE.
			WATER.	ALCOHOL.	
Acetanilidum (antifebrin), . . . . .	2 to 5 grains, . . . . .	. . . . .	194, . .	5, . . .	51
Acidum aceticum, . . . . .	externally, . . . . .	36, . . .	. . . . .	. . . . .	73
aceticum dilutum, . . . . .	30 minims to 1 dra., . .	. . . . .	. . . . .	. . . . .	
benzoicum, . . . . .	10 to 30 grains, . . . . .	. . . . .	500, . .	2, . . .	116
boricum, . . . . .	1 to 15 grains, . . . . .	. . . . .	25.6, . .	15, . . .	140
carbolicum, . . . . .	1 to 2 minims, . . . . .	. . . . .	. . . . .	. . . . .	135
glyceritum acidi carbolici, . . . . .	externally, . . . . .	25, . . .	. . . . .	. . . . .	
unguentum acidi carbolici, . . . . .	externally, . . . . .	10, . . .	. . . . .	. . . . .	
citricum, . . . . .	5 to 15 grains, . . . . .	. . . . .	0.63, . .	1.6, . . .	73
syrupus acidi citrici, . . . . .	1 to 4 drachms, . . . . .	10, . . .	. . . . .	. . . . .	
gallicum, . . . . .	5 to 30 grains, . . . . .	. . . . .	100, . .	5, . . .	128
hydrocyanicum dilutum, . . . . .	1 to 5 minims, . . . . .	2, . . .	. . . . .	. . . . .	68
hydrochloricum, . . . . .	1 to 5 minims, . . . . .	31.9, . .	. . . . .	. . . . .	70
hydrochloricum dilutum, . . . . .	5 to 30 minims, . . . . .	10, . . .	. . . . .	. . . . .	
nitricum, . . . . .	1 to 5 minims, . . . . .	68, . . .	. . . . .	. . . . .	70
nitricum dilutum, . . . . .	5 to 30 minims, . . . . .	10, . . .	. . . . .	. . . . .	
nitrohydrochloricum, . . . . .	1 to 5 minims, . . . . .	{Nitric, . . . . . 18 { Hydrochloric, 82 }	. . . . .	. . . . .	70
nitrohydrochloricum dilutum, . . . . .	5 to 30 minims, . . . . .	22, . . .	. . . . .	. . . . .	
phosphoricum, . . . . .	. . . . .	85, . . .	. . . . .	. . . . .	70
phosphoricum dilutum, . . . . .	5 to 30 minims, . . . . .	10, . . .	. . . . .	. . . . .	
salicylicum, . . . . .	5 to 30 grains, . . . . .	. . . . .	450, . .	2.4, . . .	138





sulphuricum, . . . . .	1 to 5 minims, . . . . .	92.5, . . . . .	. . . . .	. . . . .	. . . . .	70
sulphuricum aromaticum (elixir of vitriol), . . . . .	5 to 30 minims, . . . . .	10, . . . . .	. . . . .	. . . . .	. . . . .	
sulphuricum dilutum, . . . . .	5 to 30 minims, . . . . .	10, . . . . .	. . . . .	. . . . .	. . . . .	127
tannicum, . . . . .	2 to 10 grains, . . . . .	. . . . .	. . . . .	1, . . . . .	0.6, . . . . .	73
tartaricum, . . . . .	5 to 30 grains, . . . . .	. . . . .	. . . . .	0.8, . . . . .	2.5, . . . . .	63
Aconitum— . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
extractum, . . . . .	$\frac{1}{2}$ to $\frac{1}{4}$ grain, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	1 to 2 minims, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	1 to 2 minims, . . . . .	35, . . . . .	. . . . .	. . . . .	. . . . .	
Æther, . . . . .	5 to 30 minims, . . . . .	96, . . . . .	. . . . .	10, . . . . .	miscible, . . . . .	57
spiritus ætheris, . . . . .	30 minims to 2 dra., . . . . .	32.5, . . . . .	. . . . .	. . . . .	. . . . .	
spiritus ætheris compositus (Hoffman's anodyne), . . . . .	30 minims to 2 dra., . . . . .	32.5, . . . . .	. . . . .	. . . . .	. . . . .	
Alcohol, . . . . .	. . . . .	91, . . . . .	. . . . .	. . . . .	. . . . .	21
spiritus frumenti (whiskey), . . . . .	2 drachms to 2 ounces, . . . . .	44 to 50, . . . . .	. . . . .	. . . . .	. . . . .	
spiritus vini gallici (brandy), . . . . .	2 drachms to 2 ounces, . . . . .	46 to 55, . . . . .	. . . . .	. . . . .	. . . . .	
vinum album, . . . . .	1 to 4 ounces, . . . . .	10 to 14, . . . . .	. . . . .	. . . . .	. . . . .	
vinum rubrum, . . . . .	1 to 4 ounces, . . . . .	10 to 14, . . . . .	. . . . .	. . . . .	. . . . .	
alcohol absolutum, . . . . .	. . . . .	99, . . . . .	. . . . .	. . . . .	. . . . .	
alcohol deodoratum, . . . . .	. . . . .	92.5, . . . . .	. . . . .	. . . . .	. . . . .	
alcohol dilutum, . . . . .	. . . . .	41, . . . . .	. . . . .	. . . . .	. . . . .	
Aloe barbadensis, . . . . .	1 to 10 grains, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	103
Aloe socotrina, . . . . .	1 to 10 grains, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	103
extractum, . . . . .	$\frac{1}{2}$ to 5 grains, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	$\frac{1}{2}$ to 2 drachms, . . . . .	10, . . . . .	. . . . .	. . . . .	. . . . .	
tinctura aloes et myrrhæ, . . . . .	$\frac{1}{2}$ to 2 drachms, . . . . .	10 each, . . . . .	. . . . .	. . . . .	. . . . .	
aloinum, . . . . .	$\frac{1}{2}$ to 2 grains, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
Alumen . . . . .	{ 5 to 15 grains, . . . . . }	. . . . .	. . . . .	. . . . .	. . . . .	130
alumen exsiccatum, . . . . .	{ emetic, 1 to 2 drachms externally, . . . . . }	. . . . .	. . . . .	. . . . .	. . . . .	

	DOSAGE.	PERCENTAGE STRENGTH.	SOLUBILITY.		PAGE.
			WATER.	ALCOHOL.	
Ammonia—					24
aqua, . . . . .	externally, . . . . .	. . . . .	. . . . .	. . . . .	
aqua fortior, . . . . .	externally, . . . . .	10, . . . . .	. . . . .	. . . . .	
spiritus, . . . . .	10 to 60 minims, . . . . .	28, . . . . .	. . . . .	. . . . .	
spiritus aromaticus, . . . . .	10 to 60 minims, . . . . .	10, . . . . .	. . . . .	. . . . .	
linimentum, . . . . .	10 to 60 minims, . . . . .	{ carbonate, 3.4, aqua, 9, . . . . .	. . . . .	. . . . .	
Ammonium—	externally, . . . . .	35, . . . . .	. . . . .	. . . . .	26
benzoas, . . . . .	5 to 30 grains, . . . . .	. . . . .	. . . . .	. . . . .	
bromidum, . . . . .	5 to 30 grains, . . . . .	. . . . .	5, . . . . .	28, . . . . .	
carbonas (sal volatile), . . . . .	1 to 10 grains, . . . . .	. . . . .	1.5, . . . . .	30, . . . . .	
chloridum (sal ammoniac), . . . . .	5 to 30 grains, . . . . .	. . . . .	5, . . . . .	partly, . . . . .	
iodidum, . . . . .	1 to 10 grains, . . . . .	. . . . .	3, . . . . .	insoluble, . . . . .	
valerianas, . . . . .	1 to 10 grains, . . . . .	. . . . .	1, . . . . .	9, . . . . .	
liquor ammonii acetatis (spirit of mindererus), . . . . .	1 to 10 grains, . . . . .	. . . . .	readily, . . . . .	readily, . . . . .	
Ammoniacum, . . . . .	1 to 8 drachms, . . . . .	7, . . . . .	. . . . .	. . . . .	123
emplastrum cum hydrargyro, . . . . .	5 to 30 grains, . . . . .	. . . . .	. . . . .	. . . . .	11
emulsum, . . . . .	externally, . . . . .	. . . . .	. . . . .	. . . . .	
	$\frac{1}{2}$ to 2 drachms, . . . . .	4, . . . . .	. . . . .	. . . . .	
Amyl nitris, . . . . .	1 to 5 minims, . . . . .	80, . . . . .	{ nearly insoluble	miscible, . . . . .	66
Anisum, . . . . .	5 to 10 grains, . . . . .	. . . . .	. . . . .	. . . . .	12
aqua, . . . . .	1 to 8 drachms, . . . . .	. . . . .	. . . . .	. . . . .	
oleum, . . . . .	2 to 5 minims, . . . . .	0.2, . . . . .	. . . . .	. . . . .	
Anthemis, . . . . .	15 grains to 1 drachm, . . . . .	. . . . .	. . . . .	. . . . .	92















[illegible]

	DOSAGE.	PERCENTAGE STRENGTH.	SOLUBILITY.		PAGE.
			WATER.	ALCOHOL.	
Camphora—Monobromata, . . . . .	1 to 10 grains, . . . . .	. . . . .	sparingly,	readily, . . . . .	
spiritus, . . . . .	5 to 30 minims, . . . . .	10, . . . . .	. . . . .	. . . . .	12
Cannabis indica, . . . . .	1 to 5 grains, . . . . .	. . . . .	. . . . .	. . . . .	
extractum, . . . . .	$\frac{1}{4}$ to $\frac{1}{2}$ grain, . . . . .	. . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	1 to 5 minims, . . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	5 to 30 minims, . . . . .	15, . . . . .	. . . . .	. . . . .	125
Cantharis— . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
ceratum, . . . . .	externally, . . . . .	32, . . . . .	. . . . .	. . . . .	
collodium cantharidatum, . . . . .	externally . . . . .	. . . . .	externally . . . . .	. . . . .	
tinctura, . . . . .	1 to 10 minims, . . . . .	. . . . .	1 to 10 minims, . . . . .	. . . . .	12
Capsicum, . . . . .	1 to 5 grains, . . . . .	. . . . .	1 to 5 grains, . . . . .	. . . . .	
emplastrum, . . . . .	externally, . . . . .	. . . . .	externally, . . . . .	. . . . .	
extractum fluidum, . . . . .	$\frac{1}{2}$ to 3 minims, . . . . .	. . . . .	$\frac{1}{2}$ to 3 minims, . . . . .	. . . . .	
oleoresina, . . . . .	$\frac{1}{4}$ to 1 minim, . . . . .	. . . . .	$\frac{1}{4}$ to 1 minim, . . . . .	. . . . .	
tinctura, . . . . .	5 to 30 minims, . . . . .	5, . . . . .	5 to 30 minims, . . . . .	. . . . .	12
Cardamomum, . . . . .	5 to 30 grains, . . . . .	. . . . .	5 to 30 grains, . . . . .	. . . . .	
tinctura composita, . . . . .	1 to 2 drachms, . . . . .	2, . . . . .	1 to 2 drachms, . . . . .	. . . . .	12
Carum, . . . . .	5 to 30 grains, . . . . .	. . . . .	5 to 30 grains, . . . . .	. . . . .	
oleum, . . . . .	1 to 10 minims, . . . . .	. . . . .	1 to 10 minims, . . . . .	. . . . .	12
Caryophyllus, . . . . .	5 to 10 grains, . . . . .	. . . . .	5 to 10 grains, . . . . .	. . . . .	12
oleum, . . . . .	1 to 10 minims, . . . . .	. . . . .	1 to 10 minims, . . . . .	. . . . .	
Cascarilla, . . . . .	5 to 30 grains, . . . . .	. . . . .	5 to 30 grains, . . . . .	. . . . .	92
Catechu, . . . . .	5 to 30 grains, . . . . .	. . . . .	5 to 30 grains, . . . . .	. . . . .	129
tinctura composita, . . . . .	$\frac{1}{2}$ to 2 drachms, . . . . .	10, . . . . .	$\frac{1}{2}$ to 2 drachms, . . . . .	. . . . .	
trochisci, . . . . .	1 to 5, . . . . .	. . . . .	1 to 5, . . . . .	. . . . .	







Cerri oxalas, . . . . .	1 to 10 grains,	. . . . .	. . . . .	insoluble, . . . . .	insoluble, . . . . .	131 108
Chenopodium oleum, . . . . .	10 to 30 grains, 5 to 10 minims,	. . . . .	. . . . .	. . . . .	. . . . .	
Chirata, . . . . .	5 to 10 minims, 5 to 30 grains,	. . . . .	. . . . .	. . . . .	. . . . .	92
extractum fluidum, . . . . .	1 to 1 drachm, ½ to 1 drachm,	. . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	1 to 4 drachms, 10, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
Chloral, . . . . .	5 to 30 grains,	. . . . .	. . . . .	readily, . . . . .	readily, . . . . .	42
chloral formamidatum (chloral- amide), . . . . .	5 to 30 grains,	. . . . .	. . . . .	20, . . . . .	3, . . . . .	
chloralose, . . . . .	1 to 5 grains,	. . . . .	. . . . .	sparingly, freely,	sparingly, freely,	
croton chloral, . . . . .	5 to 30 grains,	. . . . .	. . . . .	sparingly, . . . . .	sparingly, . . . . .	
Chloretone, . . . . .	5 to 15 grains,	. . . . .	. . . . .	. . . . .	. . . . .	45
Chloroform, . . . . .	1 to 10 minims,	. . . . .	. . . . .	sparingly, freely,	sparingly, freely,	60
aqua, . . . . .	1 to 4 drachms,	. . . . .	. . . . .	. . . . .	. . . . .	
emulum, . . . . .	1 to 4 drachms,	. . . . .	. . . . .	. . . . .	. . . . .	
linamentum, . . . . .	externally, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
spiritus, . . . . .	10 to 60 minims,	. . . . .	. . . . .	. . . . .	. . . . .	
Cimicifuga—		. . . . .	. . . . .	. . . . .	. . . . .	31
extractum, . . . . .	1 to 5 grains,	. . . . .	. . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	5 to 30 minims,	. . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	1 to 2 drachms,	. . . . .	. . . . .	. . . . .	. . . . .	
Cinchona, . . . . .	10 to 60 grains,	. . . . .	. . . . .	20, . . . . .	. . . . .	88
extractum, . . . . .	5 to 30 grains,	. . . . .	. . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	10 to 60 minims,	. . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	1 to 2 drachms,	. . . . .	. . . . .	20, . . . . .	. . . . .	
tinctura composita (Huxham's tincture, . . . . .	1 to 4 drachms,	. . . . .	. . . . .	. . . . .	. . . . .	
infusum, . . . . .	1 to 8 drachms,	. . . . .	. . . . .	10, . . . . .	. . . . .	
Cinnamonum, . . . . .	1 to 10 grains,	. . . . .	. . . . .	6, . . . . .	. . . . .	
aqua, . . . . .	1 to 8 drachms,	. . . . .	. . . . .	. . . . .	. . . . .	12
oleum, . . . . .	1 to 5 minims,	. . . . .	. . . . .	0.2, . . . . .	. . . . .	

	DOSAGE.	PERCENTAGE STRENGTH.	SOLUBILITY.		PAGE.
			WATER.	ALCOHOL.	
Coca, . . . . .	30 to 60 grains,	. . . . .	. . . . .	. . . . .	14
extractum fluidum, . . . . .	to 2 drachms, . . . . .	. . . . .	. . . . .	. . . . .	
cocaina, . . . . .	to 2 grains, . . . . .	. . . . .	704, . . . . .	moderately, . . . . .	
cocainæ hydrochloras, . . . . .	to 2 grains, . . . . .	. . . . .	0.48, . . . . .	3.5, . . . . .	42
Codeina, . . . . .	to 2 grains, . . . . .	. . . . .	80, . . . . .	3, . . . . .	
sulphas, . . . . .	to 2 grains, . . . . .	. . . . .	. . . . .	. . . . .	
phosphas, . . . . .	to 2 grains, . . . . .	. . . . .	. . . . .	. . . . .	
Colchici radix, . . . . .	to 10 grains, . . . . .	. . . . .	. . . . .	. . . . .	84
extractum, . . . . .	to 2 grains, . . . . .	. . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	to 2 grains, . . . . .	. . . . .	. . . . .	. . . . .	
vinum, . . . . .	1 to 5 minims, . . . . .	. . . . .	. . . . .	. . . . .	
Colchici semen, . . . . .	5 to 30 minims, . . . . .	40, . . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	1 to 5 grains, . . . . .	. . . . .	. . . . .	. . . . .	84
tinctura, . . . . .	1 to 5 minims, . . . . .	. . . . .	. . . . .	. . . . .	
vinum, . . . . .	5 to 30 minims, . . . . .	15, . . . . .	. . . . .	. . . . .	
Colocynthis, . . . . .	5 to 30 minims, . . . . .	15, . . . . .	. . . . .	. . . . .	
extractum compositum, . . . . .	5 to 10 grains, . . . . .	. . . . .	. . . . .	. . . . .	106
Convallaria—	5 to 20 grains, . . . . .	. . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	29
Copaiba, . . . . .	5 to 15 minims, . . . . .	. . . . .	. . . . .	. . . . .	
massa, . . . . .	5 to 30 minims, . . . . .	. . . . .	insoluble, . . . . .	freely, . . . . .	119
oleum, . . . . .	5 to 30 grains, . . . . .	. . . . .	. . . . .	. . . . .	
resin, . . . . .	5 to 15 minims, . . . . .	. . . . .	. . . . .	. . . . .	
Coriandrum, . . . . .	5 to 15 grains, . . . . .	. . . . .	. . . . .	. . . . .	
oleum, . . . . .	5 to 10 grains, . . . . .	. . . . .	. . . . .	. . . . .	12
	1 to 5 minims, . . . . .	. . . . .	. . . . .	. . . . .	





				150.	freely,	138
Creosotum, . . . . .	1 to 30 minims,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
aqua, . . . . .	1 to 5 drachms,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Cubea, . . . . .	10 to 60 grains,	. . . . .	I, . . . . .	. . . . .	. . . . .	119
extractum fluidum,	10 to 60 minims,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
oleoresina, . . . . .	5 to 30 minims,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
oleum, . . . . .	5 to 15 minims,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
tinctura, . . . . .	$\frac{1}{2}$ to 2 drachms,	. . . . .	20, . . . . .	. . . . .	. . . . .	. . . . .
trochisci, . . . . .	1 to 5, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Cuprum—	(astringent, $\frac{1}{10}$ to $\frac{1}{2}$	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
sulphas, . . . . .	grain, . . . . .	. . . . .	. . . . .	2.6, . . . . .	insoluble, . . . . .	100
	(emetic, 2 to 5 grains,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
arsenis, . . . . .	$\frac{1}{200}$ to $\frac{1}{100}$ grain,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Cusso, . . . . .	1 to 5 drachms,	. . . . .	. . . . .	. . . . .	. . . . .	109
extractum fluidum, . . . . .	1 to 5 drachms,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Diastase, . . . . .	1 to 5 grains,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Digitalis, . . . . .	$\frac{1}{2}$ to 2 grains,	. . . . .	. . . . .	. . . . .	. . . . .	94
extractum, . . . . .	$\frac{1}{2}$ to $\frac{1}{2}$ grain,	. . . . .	. . . . .	. . . . .	. . . . .	26
extractum fluidum, . . . . .	$\frac{1}{2}$ to 2 minims,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
infusum, . . . . .	1 to 4 drachms,	. . . . .	1.5 . . . . .	. . . . .	. . . . .	. . . . .
tinctura, . . . . .	5 to 20 minims,	. . . . .	15, . . . . .	. . . . .	. . . . .	. . . . .
digitalinum, . . . . .	$\frac{1}{60}$ to $\frac{1}{50}$ grain,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Diuretin (theobrominæ sodio-sali- cylas), . . . . .	10 to 20 grains,	. . . . .	. . . . .	sparingly,	fairly, . . . . .	119
Elaterium, . . . . .	$\frac{1}{6}$ grain, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	105
elaterinum, . . . . .	$\frac{1}{30}$ to $\frac{1}{15}$ grain,	. . . . .	. . . . .	4250, . . . . .	337, . . . . .	. . . . .
elaterini trituratio, . . . . .	$\frac{1}{4}$ to 1 grain,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Ergota, . . . . .	1 to 20 grains,	. . . . .	. . . . .	. . . . .	. . . . .	31
extractum, . . . . .	1 to 10 grains,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
extractum fluidum, . . . . .	20 to 60 minims,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
ergotinum, . . . . .	2 to 10 grains,	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .

	DOSAGE.	PERCENTAGE STRENGTH.	SOLUBILITY.		PAGE.
			WATER	ALCOHOL.	
Eucalyptus, . . . . .	10 to 60 grains,	. . . . .	. . . . .	. . . . .	118
extractum fluidum, . . . . .	10 to 60 minims,	. . . . .	. . . . .	. . . . .	
oleum, . . . . .	2 to 20 minims,	. . . . .	. . . . .	. . . . .	
eucalyptol, . . . . .	2 to 10 minims,	. . . . .	sparingly,	freely,	54
Exalgin, . . . . .	1 to 5 grains,	. . . . .	. . . . .	. . . . .	
Fel bovis purificatum, . . . . .	5 to 10 grains,	. . . . .	. . . . .	. . . . .	
Ferrum,—	. . . . .	. . . . .	. . . . .	. . . . .	104
albuminas, . . . . .	2 to 10 grains,	. . . . .	fairly,	insoluble,	
carbonas saccharatus, . . . . .	2 to 10 grains,	. . . . .	partly,	insoluble,	
chloridum, . . . . .	externally usually,	. . . . .	freely,	freely,	110
citras, . . . . .	1 to 5 grains,	. . . . .	{slowly	insoluble,	
et ammonii citras, . . . . .	1 to 5 grains,	. . . . .	{but freely	insoluble,	
liquor et ammonii acetatis (Basham's mixture), . . . . .	1 to 5 drachms,	. . . . .	freely, . . . . .	. . . . .	13.6,
liquor subsulphatis (Monsel's), . . . . .	{externally, . . . . .}	{iron, 2, . . . . .}	. . . . .	. . . . .	
massa carbonatis (Vallet's mass), . . . . .	{2 to 10 minims, . . . . .}	{ammonium, 20}	. . . . .	. . . . .	
oxidum hydratum, . . . . .	2 to 10 grains,	. . . . .	. . . . .	. . . . .	insoluble,
phosphas solubilis, . . . . .	1 drachm or more,	. . . . .	freely, . . . . .	insoluble,	
pyrophosphas solubilis, . . . . .	1 to 5 grains,	. . . . .	freely, . . . . .	insoluble,	
reductum (Quevenne's iron; Iron by hydrogen), . . . . .	1 to 5 grains,	. . . . .	. . . . .	. . . . .	1.8,
subsulphas (Monsel's salt), . . . . .	1 to 5 grains,	. . . . .	. . . . .	. . . . .	
sulphas (copperas), . . . . .	1 to 5 grains,	. . . . .	. . . . .	insoluble,	

	slowly,	insoluble, . .
12		
143		
56		
92		
67		
70		
118		
109		

	DOSAGE.	PERCENTAGE STRENGTH.	SOLUBILITY.		PAGE.
			WATER.	ALCOHOL.	
Guaiacolum. . . . .	5 to 30 minims,	. . . . .	200, .	freely, . . .	138
carbonas, . . . . .	5 to 30 grains,	. . . . .	insoluble,	soluble. . .	
Guaiacum, . . . . .	$\frac{1}{2}$ to 1 drachm,	. . . . .	. . . . .	. . . . .	
resina, . . . . .	5 to 30 grains,	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	$\frac{1}{2}$ to 1 drachm,	20, . . .	. . . . .	. . . . .	
tinctura ammoniata, . . . . .	$\frac{1}{2}$ to 1 drachm,	20, . . .	. . . . .	. . . . .	129
Hæmatoxylon— . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
extractum, . . . . .	5 to 30 grains,	. . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	1 to 2 drachms,	. . . . .	. . . . .	. . . . .	
Hamamelis— . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	$\frac{1}{2}$ to 1 drachm,	. . . . .	. . . . .	. . . . .	129
Humulus— . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	49
tinctura, . . . . .	1 to 8 drachms,	20, . . .	. . . . .	. . . . .	
Hydrargyrum— . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	79
cum creta (gray powder), . . . . .	1 to 10 grains,	. . . . .	insoluble,	insoluble, . .	
chloridum corrosivum, . . . . .	$\frac{1}{50}$ to $\frac{1}{10}$ grain,	. . . . .	16, . . .	3, . . .	
chloridum mite, . . . . .	$\frac{1}{20}$ to 10 grains,	. . . . .	insoluble,	insoluble, . .	
iodidum flavum, . . . . .	$\frac{1}{6}$ to 1 grain,	. . . . .	insoluble,	insoluble, . .	
iodidum rubrum, . . . . .	$\frac{1}{80}$ to $\frac{1}{10}$ grain,	. . . . .	insoluble,	130, . . .	
massa, . . . . .	1 to 10 grains,	33, . . .	. . . . .	. . . . .	
oleatum, . . . . .	externally, . . . . .	. . . . .	. . . . .	. . . . .	
oxidum flavum, . . . . .	externally, . . . . .	20, . . .	insoluble,	insoluble, . .	
oxidum rubrum, . . . . .	$\frac{1}{60}$ to $\frac{1}{10}$ grain,	. . . . .	insoluble,	insoluble, . .	
subsulphas flavus (Turpeth mineral), . . . . .	$\frac{1}{2}$ to 5 grains,	. . . . .	2,000,	insoluble, . .	94







[illegible]

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			WATER.	ALCOHOL.	
Ipecacuanha—syrupus, . . . . .	(expectorant, 5 to 30 minims, . . . . . (emetic, 2 to 5 drachms	7, . . . . .	. . . . .	. . . . .	
vinum, . . . . .	(expectorant, 5 to 30 minims, . . . . .	10, . . . . .	. . . . .	. . . . .	
Jalapa, . . . . .	5 to 30 grains, . . . . .	. . . . .	. . . . .	. . . . .	106
extractum, . . . . .	1 to 5 grains, . . . . .	. . . . .	. . . . .	. . . . .	
pulvis compositus, . . . . .	10 to 60 grains, . . . . .	35, . . . . .	. . . . .	. . . . .	119
Juniperus, . . . . .	$\frac{1}{2}$ to 1 ounce, . . . . .	. . . . .	. . . . .	. . . . .	
oleum, . . . . .	1 to 10 minims, . . . . .	. . . . .	. . . . .	. . . . .	
spiritus, . . . . .	$\frac{1}{2}$ to 2 drachms, . . . . .	5, . . . . .	. . . . .	. . . . .	
spiritus compositus, . . . . .	1 to 4 drachms, . . . . .	0.4, . . . . .	. . . . .	. . . . .	109
Kamala, . . . . .	1 to 2 drachms, . . . . .	. . . . .	. . . . .	. . . . .	129
Kino, . . . . .	5 to 30 grains, . . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	$\frac{1}{2}$ to 2 drachms, . . . . .	10, . . . . .	. . . . .	. . . . .	129
Krameria—	. . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	1 to 2 drachms, . . . . .	20, . . . . .	. . . . .	. . . . .	
Lactucarium, . . . . .	5 to 30 grains, . . . . .	. . . . .	. . . . .	. . . . .	
syrupus, . . . . .	1 to 4 drachms, . . . . .	10, . . . . .	. . . . .	. . . . .	
tinctura, . . . . .	$\frac{1}{2}$ to 1 drachm, . . . . .	50, . . . . .	. . . . .	. . . . .	
Lavandula—	. . . . .	. . . . .	. . . . .	. . . . .	
oleum, . . . . .	1 to 5 minims, . . . . .	. . . . .	. . . . .	. . . . .	12
spiritus, . . . . .	5 to 30 minims, . . . . .	5, . . . . .	. . . . .	. . . . .	
tinctura composita, . . . . .	$\frac{1}{2}$ to 2 drachms, . . . . .	0.8, . . . . .	. . . . .	. . . . .	







	DOSAGE.	PERCENTAGE STRENGTH.	SOLUBILITY.		PAGE.
			WATER.	ALCOHOL.	
<i>Mentha viridis</i> —					
oleum, . . . . .	1 to 5 minims,	. . . . .	. . . . .	. . . . .	
spiritus, . . . . .	5 to 30 minims,	. . . . .	. . . . .	. . . . .	
Menthol, . . . . .	$\frac{1}{2}$ to 1 grain, . . . . .	. . . . .	. . . . .	. . . . .	12
Methyl salicylas, . . . . .	5 to 30 minims,	. . . . .	sparingly,	freely,	143
Methylene blue, . . . . .	1 to 5 grains,	. . . . .	sparingly,	readily,	91
Morphina, . . . . .	$\frac{1}{4}$ to $\frac{1}{2}$ grain, . . . . .	. . . . .	readily,	readily,	41
acetas, . . . . .	$\frac{1}{4}$ to $\frac{1}{2}$ grain, . . . . .	. . . . .	4350,	300,	
hydrochloras, . . . . .	$\frac{1}{4}$ to $\frac{1}{2}$ grain, . . . . .	. . . . .	2.5,	47.6,	
sulphas, . . . . .	$\frac{1}{4}$ to $\frac{1}{2}$ grain, . . . . .	. . . . .	24,	62,	
Moschus, . . . . .	$\frac{1}{4}$ to $\frac{1}{2}$ grain, . . . . .	. . . . .	21,	702,	
tinctura, . . . . .	5 to 10 grains,	. . . . .	. . . . .	. . . . .	11
Myristica, . . . . .	1 to 5 drachms,	. . . . .	. . . . .	. . . . .	
oleum, . . . . .	5 to 30 grains,	5, . . . . .	. . . . .	. . . . .	12
spiritus, . . . . .	1 to 5 minims,	. . . . .	. . . . .	. . . . .	
Myrrha, . . . . .	5 to 30 minims,	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	5 to 30 grains,	5, . . . . .	. . . . .	. . . . .	
Nitro-glycerinum, . . . . .	5 to 30 grains,	. . . . .	. . . . .	. . . . .	
Nux vomica, . . . . .	$\frac{1}{100}$ to $\frac{1}{50}$ grain,	20, . . . . .	. . . . .	. . . . .	67
extractum, . . . . .	1 to 5 grains,	. . . . .	. . . . .	. . . . .	18
extractum fluidum, . . . . .	$\frac{1}{4}$ to $\frac{1}{2}$ grain, . . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	1 to 5 minims,	. . . . .	. . . . .	. . . . .	
Oleum morrhue, . . . . .	5 to 20 minims,	2, . . . . .	. . . . .	. . . . .	87
Oleum ricini, . . . . .	$\frac{1}{2}$ to 8 drachms,	. . . . .	. . . . .	. . . . .	102
Oleum tiglii, . . . . .	1 to 8 drachms,	. . . . .	. . . . .	. . . . .	104
	$\frac{1}{2}$ to 2 minims,	. . . . .	. . . . .	. . . . .	







Opium, . . . . .	$\frac{1}{2}$ to 2 grains,	morphine, 9,	. . . . .	38
acetum, . . . . .	5 to 20 minims,	20, . . . . .	. . . . .	
extractum, . . . . .	$\frac{1}{6}$ to 1 grain,	18, . . . . .	. . . . .	
pulvis, . . . . .	$\frac{1}{2}$ to 2 grains	13 to 15, . . . . .	. . . . .	
pulvis ipecacuanhæ et opii (Do- ver's powder), . . . . .	5 to 10 grains,	{ opium, 10, . . . . . (ipecac, 10, . . . . .)	. . . . .	
tinctura (laudanum), . . . . .	5 to 20 minims,	10, . . . . .	. . . . .	
tinctura camphorata (paregoric), . . . . .	$\frac{1}{2}$ to 4 drachms,	{ opium, 0.4, . . . . . { camphor, 0.4, . . . . .	. . . . .	
tinctura deodorata, . . . . .	5 to 20 minims,	10, . . . . .	. . . . .	
tinctura ipecacuanhæ et opii, . . . . .	5 to 20 minims,	{ opium, 10, . . . . . (ipecac, 10, . . . . .)	. . . . .	
vinum (Sydenham's laudanum), . . . . .	5 to 20 minims,	10, . . . . .	. . . . .	143
Organic Drugs, . . . . .	. . . . .	. . . . .	. . . . .	63
Oxidum nitrosum, . . . . .	inhalation,	. . . . .	. . . . .	93
Pancreatinum, . . . . .	5 to 30 grains,	. . . . .	slowly,	
Paraldehydum, . . . . .	$\frac{1}{2}$ to 2 drachms,	. . . . .	8.5,	
Pepo, . . . . .	1 to 3 ozs., in emulsion,	. . . . .	. . . . .	50
Pepsinum, . . . . .	5 to 30 grains,	. . . . .	. . . . .	110
saccharatum, . . . . .	$\frac{1}{2}$ to 4 drachms,	10, . . . . .	100,	93
Phenacetinum, . . . . .	1 to 10 grains,	. . . . .	freely,	
Phenocoll hydrochloridum, . . . . .	2 to 15 grains,	. . . . .	sparingly,	53
Phosphorus, . . . . .	$\frac{1}{100}$ to $\frac{1}{80}$ grain,	. . . . .	20,	54
elixir, . . . . .	$\frac{1}{2}$ to 2 drachms,	. . . . .	insoluble,	85
oleum, . . . . .	1 to 5 minims,	$\frac{1}{36}$ , . . . . .	. . . . .	
pilulæ ( $\frac{1}{100}$ grain), . . . . .	1 to 2, . . . . .	1, . . . . .	. . . . .	
spiritus, . . . . .	5 to 30 minims,	$\frac{1}{4}$ , . . . . .	. . . . .	
zinci phosphidum, . . . . .	$\frac{1}{25}$ to $\frac{1}{12}$ grain,	. . . . .	insoluble,	
Physostigma, . . . . .	1 to 4 grains,	. . . . .	. . . . .	54
extractum, . . . . .	$\frac{1}{40}$ to $\frac{1}{6}$ grain,	. . . . .	. . . . .	85
tinctura, . . . . .	5 to 15 minims,	15, . . . . .	. . . . .	

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			WATER.	ALCOHOL.	
Physostigma, —					
physostigminæ (eserine) salicylas,	$\frac{1}{120}$ to $\frac{1}{30}$ grain,	• • • • •	150, • •	12, • • •	
physostigminæ (eserine) sulphas, •	$\frac{1}{120}$ to $\frac{1}{30}$ grain, •	• • • • •	freely, • •	freely, • •	121
Pilocarpus, • • • • •	10 to 60 grains, •	• • • • •	• • • • •	• • • • •	
extractum fluidum, • • • • •	10 to 60 minims, •	• • • • •	• • • • •	• • • • •	
pilocarpinæ hydrochloras, • • • •	$\frac{1}{40}$ to $\frac{1}{2}$ grain, •	• • • • •	freely, • •	freely, • •	12
Pimenta, • • • • •	1 to 10 grains, •	• • • • •	• • • • •	• • • • •	
oleum, • • • • •	1 to 5 minims, •	• • • • •	• • • • •	• • • • •	
Piper, • • • • •	1 to 5 minims, •	• • • • •	• • • • •	• • • • •	12
oleoresina, • • • • •	5 to 30 grains, •	• • • • •	• • • • •	• • • • •	
piperinum, • • • • •	$\frac{1}{4}$ to 1 grain, •	• • • • •	• • • • •	• • • • •	
Piperazinum, • • • • •	$\frac{1}{2}$ to 5 grains, •	• • • • •	insoluble,	30, • •	120
Pix liquida, • • • • •	5 to 15 grains, •	• • • • •	freely, • •	• • • • •	116
oleum, • • • • •	5 to 30 grains, •	• • • • •	• • • • •	• • • • •	
syrupus, • • • • •	1 to 5 minims, •	• • • • •	1 to 5 minims, •	• • • • •	
unguentum, • • • • •	1 to 2 drachms, •	7.5, • •	• • • • •	• • • • •	
Plumbum, — • • • • •	externally, • • •	50, • •	• • • • •	• • • • •	
acetas (sugar of lead), • • • • •	• • • • •	• • • • •	• • • • •	• • • • •	133
carbonas, (white lead), • • • • •	1 to 5 grains, •	• • • • •	• • • • •	• • • • •	
ceratum subacetatis, • • • • •	externally, • • •	• • • • •	2, 3, insoluble,	insoluble, • •	
emплаstrum (diachylon plaster), •	externally, • • •	20, • •	• • • • •	• • • • •	
iodidum, • • • • •	externally, • • •	• • • • •	• • • • •	• • • • •	
liquor subacetatis, • • • • •	$\frac{1}{2}$ to 1 grain, •	• • • • •	• • • • •	• • • • •	
unguentum carbonatis, • • • • •	externally, • • •	25, • •	2000, • •	slightly, • •	
Podophyllum, • • • • •	externally, • • •	10, • •	• • • • •	• • • • •	
	5 to 20 grains, •	• • • • •	• • • • •	• • • • •	107





extractum, . . . . .	$\frac{1}{2}$ to 5 grains,	. . . . .	. . . . .	. . . . .	. . . . .
extractum fluidum, . . . . .	5 to 20 minims,	. . . . .	. . . . .	. . . . .	. . . . .
resina, . . . . .	$\frac{1}{10}$ to 1 grain,	. . . . .	. . . . .	. . . . .	. . . . .
Potassium, — . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	74
acetas, . . . . .	10 to 60 grains,	. . . . .	. . . . .	0.36,	. . . . .
bicarbonas (saleratus), . . . . .	10 to 60 grains,	. . . . .	. . . . .	3.2,	1.9,
bitartras (cream of tartar), . . . . .	10 to 60 grains,	. . . . .	. . . . .	201,	insoluble, . .
bromidum, . . . . .	10 to 60 grains,	. . . . .	. . . . .	. . . . .	sparingly,
carbonas, . . . . .	5 to 30 grains,	. . . . .	. . . . .	1.6,	200,
chloras, . . . . .	2 to 15 grains,	. . . . .	. . . . .	1.1,	insoluble,
citras, . . . . .	5 to 30 grains,	. . . . .	. . . . .	16.7,	insoluble, . .
iodidum, . . . . .	5 to 30 grains,	. . . . .	. . . . .	0.6,	sparingly,
hypophosphis, . . . . .	5 to 30 grains,	. . . . .	. . . . .	0.75,	18,
nitras (saltpetre, nitre), . . . . .	5 to 15 grains,	. . . . .	. . . . .	0.6,	7.3,
permanganas, . . . . .	$\frac{1}{2}$ to 2 grains,	. . . . .	. . . . .	3.8,	sparingly,
et sodii tartras (Rochelle salts), . . . . .	1 to 5 drachms,	. . . . .	. . . . .	16,	decomposed,
trochisci chloratis, . . . . .	1 to 3,	. . . . .	. . . . .	1.4,	insoluble, . .
liquor potassæ, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	105
Prunus Virginiana, . . . . .	5,	. . . . .	. . . . .	. . . . .	. . . . .
extractum fluidum, . . . . .	$\frac{1}{2}$ to 1 drachm,	. . . . .	. . . . .	. . . . .	92
infusum, . . . . .	$\frac{1}{2}$ to 1 drachm,	. . . . .	. . . . .	. . . . .	. . . . .
syrupus, . . . . .	4 to 8 drachms,	. . . . .	. . . . .	. . . . .	. . . . .
Quassia, . . . . .	$\frac{1}{2}$ to 4 drachms,	. . . . .	. . . . .	. . . . .	. . . . .
extractum, . . . . .	5 to 30 grains,	. . . . .	. . . . .	. . . . .	92
extractum fluidum, . . . . .	1 to 3 grains,	. . . . .	. . . . .	. . . . .	. . . . .
infusum, . . . . .	$\frac{1}{2}$ to 1 pint,	. . . . .	. . . . .	. . . . .	. . . . .
Quinina, . . . . .	5 to 30 grains,	. . . . .	. . . . .	1670,	6,
bisulphas, . . . . .	1 to 15 grains,	. . . . .	. . . . .	10,	32,
hydrobromas, . . . . .	1 to 15 grains,	. . . . .	. . . . .	54,	0.6,
hydrochloras, . . . . .	1 to 15 grains,	. . . . .	. . . . .	34,	3,
sulphas, . . . . .	2 to 30 grains,	. . . . .	. . . . .	740,	65,

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Quinina—					
valerianas, . . . . .	1 to 15 grains,	. . . . .	100, . .	5, . .	
Resorcinum, . . . . .	. . . . .	. . . . .	0.6, . .	0.5, . .	102
Rhamnus purshiana, . .	15 to 60 grains,	. . . . .	. . . . .	. . . . .	
extractum, . . . . .	1 to 10 grains,	. . . . .	. . . . .	. . . . .	
extractum fluidum, . .	$\frac{1}{4}$ to 1 drachm,	. . . . .	. . . . .	. . . . .	
Rheum, . . . . .	5 to 30 grains,	. . . . .	. . . . .	. . . . .	104
extractum, . . . . .	5 to 10 grains,	. . . . .	. . . . .	. . . . .	
extractum fluidum, . .	5 to 30 minims,	. . . . .	. . . . .	. . . . .	
pilulæ (3 grains), . . . .	1 to 5, . . . . .	. . . . .	. . . . .	. . . . .	
pilulæ compositæ (2 grains),	1 to 5, . . . . .	. . . . .	. . . . .	. . . . .	
syrupus, . . . . .	1 to 4 drachms,	10, . .	. . . . .	. . . . .	
syrupus aromaticus, . .	$\frac{1}{2}$ to 2 drachms,	15, . .	. . . . .	. . . . .	
tinctura, . . . . .	$\frac{1}{2}$ to 2 drachms,	10, . .	. . . . .	. . . . .	
tinctura aromatica, . .	$\frac{1}{2}$ to 2 drachms,	20, . .	. . . . .	. . . . .	
Ruta, . . . . .	5 to 20 grains,	. . . . .	. . . . .	. . . . .	124
oleum, . . . . .	1 to 5 minims,	. . . . .	. . . . .	. . . . .	
Sabina, . . . . .	5 to 20 grains,	. . . . .	. . . . .	. . . . .	124
oleum, . . . . .	1 to 5 minims,	. . . . .	. . . . .	. . . . .	
Salicinum, . . . . .	$\frac{1}{4}$ to 2 drachms,	. . . . .	. . . . .	. . . . .	
Salol, . . . . .	2 to 15 grains,	. . . . .	28, . .	30, . .	140
Santalum—	. . . . .	. . . . .	sparingly,	10, . .	119
oleum, . . . . .	5 to 20 minims,	. . . . .	. . . . .	. . . . .	
Santonium, . . . . .	1 to 5 grains,	. . . . .	. . . . .	. . . . .	
trochisci ( $\frac{1}{2}$ grain), . .	2 to 10, . . . .	. . . . .	sparingly,	40, . .	108







Scammonium, . . . . .	1 to 20 grains, . . . . .	. . . . .	. . . . .	. . . . .	107
resina, . . . . .	1 to 10 grains, . . . . .	. . . . .	. . . . .	. . . . .	
Scilla, . . . . .	1 to 5 grains, . . . . .	. . . . .	. . . . .	. . . . .	30
acetum, . . . . .	5 to 30 minims, . . . . .	10, . . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	1 to 5 minims, . . . . .	. . . . .	. . . . .	. . . . .	
syrupus, . . . . .	30 to 60 minims, . . . . .	4.5, . . . . .	. . . . .	. . . . .	
syrupus compositus (Coxe's hive syrup), . . . . .	$\frac{1}{4}$ to 2 drachms, . . . . .	8, . . . . .	. . . . .	. . . . .	
tinctura, . . . . .	5 to 30 minims, . . . . .	15, . . . . .	. . . . .	. . . . .	
Scoparius, . . . . .	$\frac{1}{2}$ to 1 drachm, . . . . .	. . . . .	. . . . .	. . . . .	30
extractum fluidum, . . . . .	$\frac{1}{2}$ to 1 drachm, . . . . .	. . . . .	. . . . .	freely, . . . . .	
sparteinæ sulphas, . . . . .	$\frac{1}{20}$ to $\frac{1}{2}$ grain, . . . . .	. . . . .	. . . . .	freely, . . . . .	117
Senega, . . . . .	5 to 30 grains, . . . . .	. . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	5 to 30 minims, . . . . .	. . . . .	. . . . .	. . . . .	
syrupus, . . . . .	$\frac{1}{2}$ to 1 drachm, . . . . .	20, . . . . .	. . . . .	. . . . .	
syrupus scillæ compositus, . . . . .	10 to 60 minims, . . . . .	8, . . . . .	. . . . .	. . . . .	
Senna, . . . . .	$\frac{1}{4}$ to 3 drachms, . . . . .	. . . . .	. . . . .	. . . . .	104
confectio, . . . . .	1 to 3 drachms, . . . . .	10, . . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	$\frac{1}{4}$ to 3 drachms, . . . . .	. . . . .	. . . . .	. . . . .	
infusum compositum, . . . . .	1 to 5 ounces, . . . . .	6, . . . . .	. . . . .	. . . . .	
pulvis glycyrrhizæ compositus, . . . . .	$\frac{1}{2}$ to 2 drachms, . . . . .	18, . . . . .	. . . . .	. . . . .	
syrupus, . . . . .	$\frac{1}{2}$ to 2 drachms, . . . . .	25, . . . . .	. . . . .	. . . . .	
Serpentaria—	. . . . .	. . . . .	. . . . .	. . . . .	92
extractum fluidum, . . . . .	5 to 30 minims, . . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	1 to 2 drachms, . . . . .	. . . . .	. . . . .	. . . . .	
tinctura cinchonæ composita, . . . . .	1 to 4 drachms, . . . . .	2, . . . . .	. . . . .	. . . . .	
Serums	. . . . .	. . . . .	. . . . .	. . . . .	146
Sinapis, . . . . .	1 to 4 drachms (emetic)	. . . . .	. . . . .	. . . . .	126
Sodium, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	75
acetas, . . . . .	5 to 30 grains, . . . . .	. . . . .	. . . . .	. . . . .	
arsenas, . . . . .	$\frac{1}{60}$ to $\frac{1}{10}$ grain, . . . . .	. . . . .	. . . . .	1-4, . . . . .	
		. . . . .	. . . . .	4, . . . . .	sparingly,

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Sodium—					
benzoas, . . . . .	5 to 30 grains,	. . . . .	1.8, . .	45, . .	. .
bicarbonas, . . . . .	5 to 30 grains, . . . .	. . . . .	11.3, . .	insoluble, . .	. .
boras, . . . . .	5 to 30 grains, . . . .	. . . . .	16, . .	insoluble, . .	141
bromidum, . . . . .	10 to 60 grains, . . . .	. . . . .	1.2, . .	13, . .	. .
carbonas (washing soda), . . . .	5 to 30 grains, . . . .	. . . . .	1.6, . .	insoluble, . .	. .
chloridum, . . . . .	$\frac{1}{2}$ to 2 ounces (emetic), . . . .	. . . . .	2.8, . .	insoluble, . .	. .
hypophosphis, . . . . .	5 to 30 grains, . . . .	. . . . .	1, . .	30, . .	. .
hyposulphis, . . . . .	5 to 30 grains, . . . .	. . . . .	0.65, . .	insoluble, . .	. .
iodidum, . . . . .	5 to 30 grains, . . . .	. . . . .	0.6, . .	3, . .	. .
nitras, . . . . .	5 to 30 grains, . . . .	. . . . .	1.3, . .	100, . .	. .
nitris, . . . . .	1 to 2 grains, . . . .	. . . . .	1.5, . .	sparingly, . .	. .
phosphas, . . . . .	$\frac{1}{2}$ to 8 drachms, . . . .	. . . . .	5.8, . .	insoluble, . .	105
salicylas, . . . . .	5 to 30 grains, . . . .	. . . . .	0.9, . .	6, . .	. .
sulphas (Glauber's salts), . . . .	1 to 8 drachms, . . . .	. . . . .	2.8, . .	insoluble, . .	105
et potassii tartras (Rochelle salts), . . . .	1 to 5 drachms, . . . .	. . . . .	1.4, . .	insoluble, . .	. .
Somnal, . . . . .	10 to 40 minims, . . . .	. . . . .	3, . .	freely, . .	30
Sparteinae sulphas, . . . . .	$\frac{1}{20}$ to $\frac{1}{2}$ grain, . . . .	. . . . .	freely, . .	freely, . .	109
Spigelia, . . . . .	$\frac{1}{4}$ to 2 drachms, . . . .	. . . . .	. . . . .	. . . . .	. .
extractum fluidum, . . . . .	$\frac{1}{4}$ to 2 drachms, . . . .	. . . . .	. . . . .	. . . . .	. .
Spiritus ætheris nitrosi (sweet spirits of nitre), . . . . .	10 to 60 minims, . . . .	4, . .	. . . . .	. . . . .	123
Stramonii folia, . . . . .	cigarettes, . . . . .	. . . . .	. . . . .	. . . . .	37
Stramonii semen, . . . . .	1 to 3 grains, . . . .	. . . . .	. . . . .	. . . . .	37
extractum, . . . . .	$\frac{1}{6}$ to $\frac{1}{2}$ grain, . . . .	. . . . .	. . . . .	. . . . .	. .





extractum fluidum,	1 to 3 minims,	.	.	.	.	.	.	.	.
tinctura, . . .	5 to 20 minims,	.	.	.	.	.	.	.	.
unguentum, . .	externally,	.	.	.	.	.	15,	.	.
Strontium—	.	.	.	.	.	.	10,	.	.
bromidum, . .	5 to 30 grains,	.	.	.	.	.	.	.	.
iodidum, . . .	5 to 30 grains,	.	.	.	.	.	.	.	.
Strophanthus	.	.	.	.	.	.	.	.	.
tinctura, . . .	2 to 10 minims,	.	.	.	.	.	5,	.	.
Strychnina, .	$\frac{1}{60}$ to $\frac{1}{20}$ grain,	.	.	.	.	.	.	.	.
nitras, . . .	$\frac{1}{60}$ to $\frac{1}{20}$ grain,	.	.	.	.	.	.	.	.
sulphas, . . .	$\frac{1}{60}$ to $\frac{1}{20}$ grain,	.	.	.	.	.	.	.	.
Sulphonal	10 to 30 grains,	.	.	.	.	.	.	.	.
Sulphur—	.	.	.	.	.	.	.	.	.
lotum, . . .	1 to 2 drachms,	.	.	.	.	.	.	.	.
præcipitatum (lac sulphur),	1 to 2 drachms,	.	.	.	.	.	.	.	.
sublimatum, . .	1 to 2 drachms,	.	.	.	.	.	.	.	.
unguentum, . .	externally,	.	.	.	.	.	30,	.	.
Tetronal,	5 to 30 grains,	.	.	.	.	.	.	.	.
Terebenum,	5 to 10 minims,	.	.	.	.	.	.	.	.
Terebinthina,	2 to 10 grains,	.	.	.	.	.	.	.	.
linamentum, . .	externally,	.	.	.	.	.	35,	.	.
oleum, . . .	externally,	.	.	.	.	.	.	.	.
oleum rectificatum,	5 to 20 minims,	.	.	.	.	.	.	.	.
resina, . . .	1 to 5 grains,	.	.	.	.	.	.	.	.
Terpini hydras,	2 to 20 grains,	.	.	.	.	.	.	.	.
Thymol, . . .	1 to 5 grains,	.	.	.	.	.	.	.	.
Trional, . . .	10 to 30 grains,	.	.	.	.	.	.	.	.
Urethane, . . .	10 to 30 grains,	.	.	.	.	.	.	.	.
Valeriana, . .	15 to 60 grains,	.	.	.	.	.	.	.	.
extractum fluidum,	15 to 60 minims,	.	.	.	.	.	.	.	.
tinctura, . . .	1 to 4 drachms,	.	.	.	.	.	20,	.	.

	DOSAGE.	PERCENTAGE STRENGTH.	SOLUBILITY.		PAGE.
			WATER.	ALCOHOL.	
Valeriana—					
tinctura ammoniata, . . . . .	$\frac{1}{2}$ to 1 drachm, . . . . .	20, . . . . .	. . . . .	. . . . .	
elixir ammonii valerianas, . . . . .	1 to 4 drachms, . . . . .	. . . . .	. . . . .	. . . . .	66
Veratrum viride, . . . . .	$\frac{1}{4}$ to 5 grains, . . . . .	. . . . .	. . . . .	. . . . .	
extractum fluidum, . . . . .	$\frac{1}{4}$ to 5 minims, . . . . .	. . . . .	. . . . .	. . . . .	
tinctura, . . . . .	$\frac{1}{4}$ to 5 minims, . . . . .	40, . . . . .	. . . . .	. . . . .	
Viburnum prunifolium, . . . . .	30 to 60 grains, . . . . .	. . . . .	. . . . .	. . . . .	124
extractum fluidum, . . . . .	30 to 60 minims, . . . . .	. . . . .	. . . . .	. . . . .	
Zincum—acetas, . . . . .	externally, . . . . .	. . . . .	. . . . .	. . . . .	
bromidum, . . . . .	1 to 5 grains, . . . . .	. . . . .	2.7, . . . . .	36, . . . . .	100
chloridum, . . . . .	externally, . . . . .	. . . . .	freely, . . . . .	freely, . . . . .	
oxidum, . . . . .	1 to 5 grains, . . . . .	. . . . .	0.3, . . . . .	freely, . . . . .	
sulphas, . . . . .	10 to 30 grains (emetic)	. . . . .	insoluble, . . . . .	insoluble, . . . . .	
sulphocarbolas, . . . . .	2 to 3 grains, . . . . .	. . . . .	0.6, . . . . .	insoluble, . . . . .	
unguentum oxidii, . . . . .	externally, . . . . .	. . . . .	. . . . .	. . . . .	
Zingiber, . . . . .	10 to 30 grains, . . . . .	20, . . . . .	. . . . .	. . . . .	12
tinctura, . . . . .	20 to 60 minims, . . . . .	20, . . . . .	. . . . .	. . . . .	





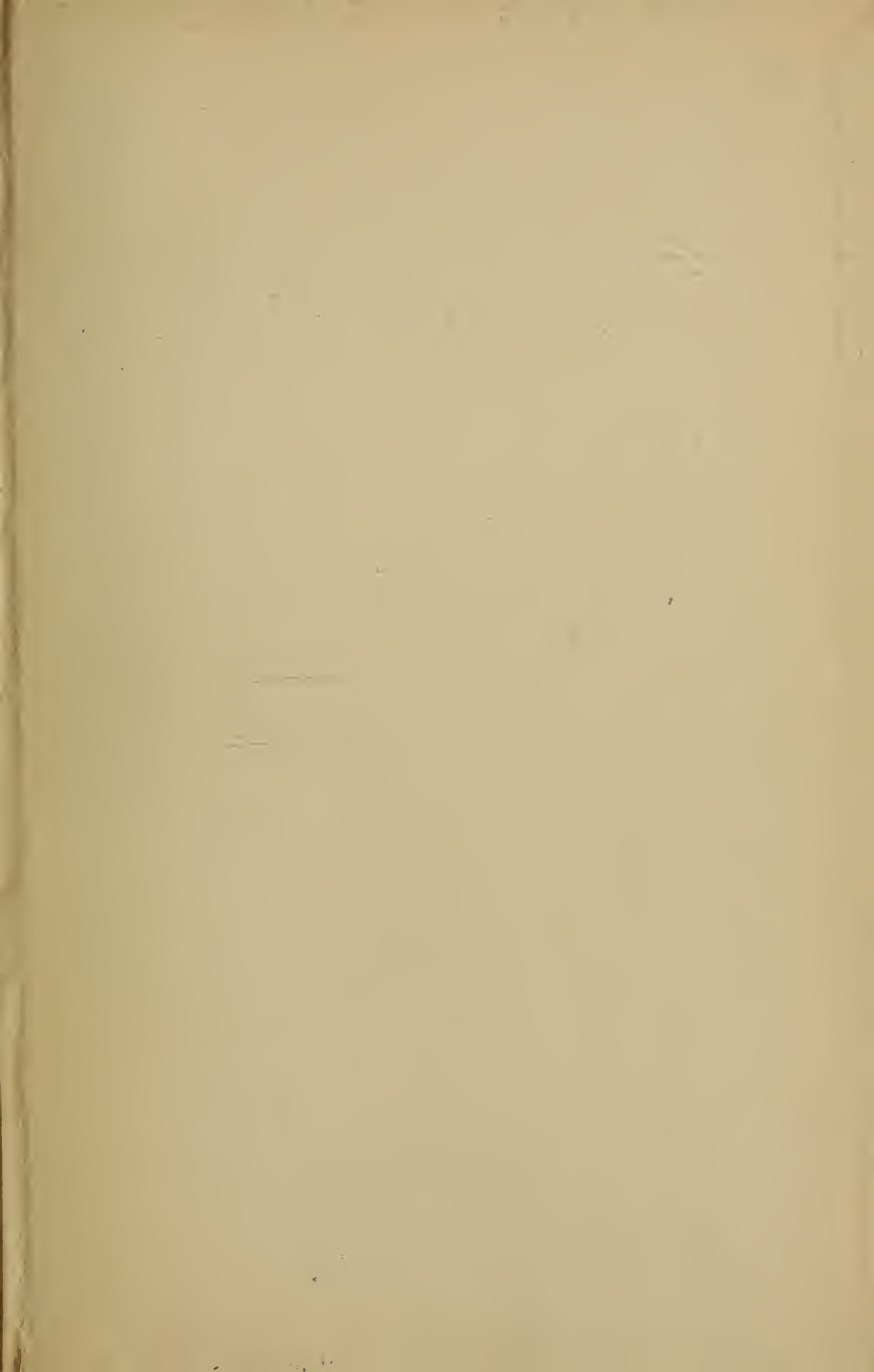






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